A STUDY OF ORGANIZATIONAL LEARNING IN A UNIVERSITY EFFICIENCY INITIATIVE

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ABSTRACT

Despite 50 years of theory development, definitions and conceptualizations of organizational learning remain divergent (Barker Scott, 2011). The systems-based approach to conceptualizing organizational learning has become influential (Senge, 1990; Yang, Watkins & Marsick, 2004). Organizational learning can be theoretically associated with concepts of efficiency and continuous improvement initiatives underway in higher educational institutions. This study was concerned with the learning experiences reported by leaders at the individual (micro), unit/departmental (meso) and organizational (macro) levels who had participated in efficiency (Lean) improvement projects.

Based upon the perceptions of university unit/departmental leaders, the study's research questions dealt with participant perceptions of the context and implementation of efficiency (Lean) initiatives at a university site. Further, the implications for organizational learning at the individual (micro), unit (meso) and institutional (macro) levels were explored.

The study was developed and presented using a case study methodology. Saldana's (2013) codes-to-theory model was used during data analysis, resulting in the development of the study's categories, subcategories, themes and conclusions. Two phases of semi-structured interviews were conducted. Study categories and subcategories were presented as the study's collected data in terms of the experiences of senior leaders and unit leaders. Where possible, voices of study participants were present via the direct presentation of interview responses by category or subcategory.

Four themes emerged from the study: effective communication promoted learning and enhanced efficiency; conceptions of organizational learning focused predominantly

on the unit; efficiency methodology was superordinate to efficiency method; and learning was conceptualized as an essential project resource. It was concluded from this study that efficiency initiatives served as an impetus for organizational learning and communication emerged as the most important factor to ease system limitations.

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CHAPTER ONE: INTRODUCTION

Introduction

Despite decades of theory development and academic study, there remains disagreement about what constitutes organizational learning or instances of a learning organization. The goal of commonly defining organizational learning has been elusive (Barker Scott, 2011; Fiol & Lyles, 1985; Garvin, 1993) or thought to be impossible (Kim, 1993; Simon, 1991). In absence of theoretical agreement, systems-focused definitions of organizational learning (Caldwell, 2012; Senge, 1990; Yang, Watkins & Marsick, 2004) have become prevalent.

This study makes a contribution to organizational learning by examining initiatives designed to enhance the efficiency of administrative functions at a Western Canadian university. Lean, an improvement methodology originally developed for use in automotive manufacturing, was used as the basis for improvement projects. The Lean approach was chosen by the university based upon board direction, the direction of the provincial government and reports of efficiency gains in the public services sector, colleges and universities and healthcare organizations. I chose to study organizational learning in this context due to my personal background as a post-secondary administrator, where I had previously been involved in institutional improvement projects and held a curiosity about how organizational learning related to project outcomes.

The significance of this study relates to the structural and philosophical changes occurring in post-secondary institutions around the world. Institutions are seeking new efficiencies to balance their funding needs with their expanding research, teaching and service missions and a need to satisfy stakeholders. As a case study, its results are not

meant to be highly generalizable or replicable, but individual and group experiences described by participants should inform future research and institutional leaders who may be considering efficiency initiatives from the perspectives of strategic focus and organizational learning requirements.

Images and Antecedents of the Learning Organization

Definitions and conceptualizations of organizational learning diverge but cluster around broadly defined themes (Easterby-Smith, Crossan & Nicolini, 2000). Garvin (1993) claimed that this divergence was due to a lack of "meaning, measurement and management" (p. 78); that is, in absence of commonly accepted definitions, theoretical or practical progress cannot be measured or managed to any real extent. Nonaka (1991) interpreted organizational learning as the appropriate use of knowledge management within one's job responsibilities, while others conceptualized it in terms of organizational culture (Mintzberg, 1983; Schein, 1996) or communities of practice (Brown & Duguid, 1991; Wenger, 2008).

Divergent metaphors have been used to represent organizational learning. It has been compared with an individual's learning potential (Barker Scott, 2011; Dodgson, 1993) or cognitive and behavioural learning theories (Inkpen & Crossan, 1995). The debate about defining organizational learning has sparked a further debate about whether or not organizational activities should be measured to ensure that learning (either individual or group) has occurred (Easterby-Smith, Crossan & Nicolini, 2000). Linking specific organizational outcomes to organizational learning has been considered perilous due to difficulties in establishing a relationship between organizational learning and

organizational outcomes (Bolman & Deal, 2008). Fiol and Lyles (1985) presented a view that distinctions should be made between organizational learning and adaptation.

Learning organizations have been viewed in terms of innovation (Hobday, 1990; Loveridge & Pitt, 1990), employee satisfaction (Bontis, Crossan & Hulland, 2002), core competencies (Prahalad & Hamel, 1990) and organizational decision-making (Dodgson, 1991; Maidique & Zirger, 1985). Yeung, Ulrich, Nason and Von Glinow (1999) claimed the learning strategy of an organization should include learning exploration (seeking new knowledge) and learning exploitation (harnessing knowledge that has already been developed). It has been suggested that organizations have preferred learning styles that should be accommodated to maximize their potential for performance (March, 1991).

Some authors have claimed it is better to acknowledge a reality that defining organizational learning is not possible (Kim, 1993; Simon, 1991). Weick and Westley (1999) argued that organizational learning is oxymoronic due to the disharmony of its constituent concepts, as the "relationship between learning and organizing is inherently uncomfortable, a tension rather than a compatibility" (p.444). Kim (1993) claimed that there is a "missing link" (p.42) between individual and group learning and tensions between them (Antonacopoulou, 2006; Bolman & Deal, 2008). Kim (1993) stated that models of organizational learning focusing excessively on individual learning would result in, at best, "fragmented learning" (p. 48) for the organization.

The Systems View of the Learning Organization

The systems view of the learning organization has become influential and frequently cited (Caldwell, 2012; Meyer, 1982; Ortenblad, 2007). However, the theoretical implications of the systems-based approach have not been empirically

explored in depth (Bui & Baruch, 2010). This study represents one step toward an exploration of the systems view of organizational learning in the context of efficiency.

Senge (1990) described five component technologies (or disciplines) required for learning organizations: *personal mastery*, *mental models*, *shared vision*, *team learning* and *systems thinking*. He defined systems thinking as the *Fifth Discipline*, "a conceptual framework, a body of knowledge and tools that have been developed over the past fifty years to make the full patterns clearer and to help us see how to change them effectively" (Senge, 1990, p. 7). The author provided examples that demonstrated how systems thinking influences organizational learning, cautioning that complexity must be considered and managed when implementing or assessing such learning.

Systems thinking can be viewed in different ways depending on the viewer's perspective. Further clarifying his position on systems thinking, Senge (2008) claimed:

> 'Systems thinking' has long been a cornerstone in our work on organizational learning, but the term often seems more daunting (it can easily sound like an intellectual task reserved for Ph.D.s) than helpful. In fact, systems thinking is not about fighting complexity with more complexity. It simply means stepping back and seeing patterns that are, when seen clearly, intuitive and easy to grasp. (p. 10)

Senge's (2008) definition prompted me to wonder if study participants might have an intuitive sense for organizational learning even if they held different definitions and conceptualizations. This definition also supported my belief that a conceptual framework based on systems thinking would be both appropriate and useful for this study. While the study's conceptual framework could rely on Senge's (1990) theory about organizational

learning and systems thinking, I believed that a limitation of establishing a study on that model would be a lack of flow or implied relationships between the various disciplines.

I drew upon Yang, Watkins and Marsick's (2004) work, which expanded the concept of organizational learning from its dimensional perspective, and how it could be assessed and validated. These authors offered a view of organizational learning using Senge's (1990) model but added a conceptual framework showing how individual learning led into organizational structure along with the system's inputs and outputs. The adaptation of this same framework to the concepts of organizational learning, efficiency and use of Lean in higher education represents an original contribution to organizational learning and will benefit those who wish to study aspects of organizational efficiency in post-secondary institutions.

Are Post-Secondary Organizations Learning Organizations?

Some authors have suggested that the nature of post-secondary institutions is antithetical to the concept of the learning organization due to their structure, culture, history and varied missions. White and Weathersby (2005) argued that faculty members are trained and rewarded for individual learning and achievement rather than for benefitting the organization as a whole. Despite structures that favour the governance of such institutions by staff and the professoriate, it is more likely that faculty members exhibit group learning and information sharing within their research communities of practice than within their own organizations (Drugovich, Saatcioglu & Bilimoria, 2004).

Patrick and Aetcher (1998) noted that if the systems view of the learning organization is appropriate, then post-secondary institutions are likely not classifiable as learning organizations because "the traditional academic framework consists of distinct

disciplines, specialized research tools and isolated learning environments" (p. 160). The authors offered a way forward on the possibilities of using systems thinking because "institutions of higher education need to create or recover a common language focused on, for example, pedagogy, institutional missions, institutional goals, and, perhaps, the state of higher education itself in the information age" (Patrick & Aetcher, 1998, p. 160).

Espousing a more optimistic view of the university as a learning organization, Lewis, Benjamin, Juda and Marcella (2008) reasoned that since faculty members desire to "explore new territory and to learn from these explorations, it seems likely that involvement in organizational learning would act as a significant motivator and satisfier within the workplace" (p. 292). Structures and culture that promote organizational learning are desirable for short and long-term initiatives, however it is important that key leadership and organizational structures exist to support this. Strong executive leadership and exemplary human resources practices were stated as success factors when developing organizational learning (Lewis et. al., 2008).

Certain barriers to organizational learning have been suggested based upon societal and cultural situations. These barriers have been described as *fragmentation*, *reactiveness* and *competition* (Kofman & Senge, 1995; Lewis et. al., 2008). Fragmentation results in non-alignment of institutional goals, usually when individual needs take precedence over group needs. Reactiveness focuses on overly directed problem solving over the possibility of creative, innovative solutions. Competition can be manifested in ways that result in appearances ("optics") being more important than actual progress. Short-term goals and directives can take precedence over longer-term objectives if competition is viewed in unhealthy ways.

Kulber and Sayers (2010) advised that the higher education sector is not particularly well established in organizational knowledge management and they further highlighted several themes indicative of challenges faced by educational leaders. However, Shaw and Perkins (1991) presented a more hopeful view of the university as a learning organization based on possibilities for dialogue and collegiality among professionals to encourage a mutual exploration of fields of knowledge and a reflective approach to learning.

The Drive for Efficiency and Effectiveness in Post-Secondary Institutions

Post-secondary institutions are complex, typically large in terms of operating and capital budgets with widening missions and goals relating to student support, teaching and research support and linkages with business and cultural communities. Institutions struggle to balance internal and external pressures to best serve stakeholders in environments of increasingly scarce resources (Dickeson, 2010). They seek enhanced efficiency and effectiveness, particularly so after the impact of the 2008 worldwide financial crisis (Chronicle of Higher Education, 2009) and changes in student enrolment patterns, preferences and students' willingness to pay for academic programs.

In Canada, universities and colleges operate in a climate of financial uncertainty during a time of heightened expectations for quality graduates, research productivity and student support. The main advocacy organization for Canadian universities has stated that "multi-year, predictable and sustained funding is an important and integral aspect" (Association of Universities and Colleges in Canada, 2012) of meeting these expectations. Canadian universities and colleges obtain a significant component of their funding from governments and there is a push for enhanced accountability as

governments themselves adopt new efficiency and effectiveness initiatives. Houston (2008) has argued that higher education has overall moved from a model focused on accountability to one focused on improvement.

A neoliberal context (Sattler, 2012) has been proposed as the reality under which governments support Canadian universities and colleges. Under neoliberal thinking, higher education is a means for individuals to better themselves, and in turn, improve a shared society. Therefore, investments in higher education should be shared between public funding, private or corporate funding and tuition. This view contrasts with the historical view that higher education serves both a public and individual good; therefore, access for all individuals, irrespective of their financial resources, is paramount. Arguments of scarcity and the necessity of personal investments typically undergird the neoliberal approach to supporting post-secondary education.

The Link Between Organizational Learning and Efficiency

Deming (1986) believed efficiency initiatives, teamwork and the learning organization all must work as a system to ensure organizational alignment. When describing factors of team success relating to projects, he claimed, "a good team has a social memory" (Deming, 1986, p. 90). Similarly, Dennis (2007) connected the use of organizational standards to organizational learning, advocating "management systems that record and share important learning points" (p.123). The author argued that good documentation and knowledge sharing enable organizations to perform even if key employees change their positions. Emiliani (1998) advanced similar claims, as, "Lean production, applied correctly, results in the ability of an organization to learn" (p. 616).

Bowen and Spear (1999), when describing the original Lean Toyota Production System (TPS) observed, "the system actually stimulates workers and managers to engage in the kind of experimentation that is widely recognized as the cornerstone of a learning organization" (p. 97). Taylor (1997) argued that due to the complexity of Lean, it is a difficult methodology to replicate within organizations that have not used it before due to its learning requirements. Robinson (1990) claimed that when organizations find ways to avoid repeated mistakes through Lean, this represented instances of organizational learning. Holweg (2006) noted that during the development of Lean in the 1950s, the concept "was not a single point invention, but the outcome of a dynamic learning process that adapted practices" (p. 432).

Francis (2014) presented a connection between organizational learning and Lean in higher education by presenting a conceptual framework and identifying structures particular to publications regarding organizational learning and efficiency. These structures indicated the importance of employee engagement/involvement, organizational standards and organizational stability (Francis, 2014). The author described analogues of these same structures in an academic setting and provided strategic recommendations for institutions considering the use of efficiency methodologies such as Lean.

Nightingale (2000) claimed that competitive excellence in academic settings relies on knowledge generation and knowledge transfer. Knowledge transfer is required to translate new discovery into enhancement of teaching and research talent. Referring to the power of organizational learning in improvement efforts, Flumerfelt (2008) claimed:

> The Lean system provides a good model for education, as it integrates well with the work of professional learning communities that bring together educators and

> school leaders on an ongoing basis for collective problem identification and problem solving. Similarly, 'Lean approaches' impact the way people think about and carry out work throughout an organization. (Para. 4)

Statement of the Problem

Despite debates about how to define the learning organization, if we accept that some form of organizational learning exists within in the context of a university, it is possible to examine the phenomenon of organizational learning in the context of an efficiency improvement initiative. Given an ongoing climate of funding challenges, and rising expectations of output, universities are taking a more renewed look at both their organizational effectiveness and efficiency. The literature relating to organizational learning typically takes a view of how such learning benefits an organization's effectiveness; there are fewer publications and studies that speak to the relationship between organizational learning and efficiency.

This study endeavours to contribute to the field of knowledge on organizational learning by richly describing the learning experiences of those involved with university efficiency initiatives and giving voice to them individually and collectively.

Research Questions

The purpose of this study was to determine how unit/departmental leaders perceived a university efficiency (Lean) initiative from the perspective of organizational learning principles. Based upon the perceptions of these participants, the study's research questions were:

1. How did participants perceive the context and implementation of an efficiency (Lean) initiative at one university site?

2. What were the implications of these efficiency initiatives for organizational learning at the individual (micro) level?
3. What were the implications of these efficiency initiatives for organizational learning at the departmental or unit (meso) level?
4. What were the implications of these efficiency initiatives for organizational learning at the institutional (macro) level?

Assumptions

This section contains key assumptions that I made when planning this study. I have assumed that individuals involved in university Lean projects were able to recall experiences in sufficient detail to provide valid data for this study. Given the professional backgrounds of participants and the relatively short period of time between data collection and their experiences, I have concluded that data were valid and useful.

I have also made the assumption that study participants were able to describe not only the efficiency initiatives they were involved in, but also the nature of individual, group and organizational learning regarding these initiatives. Given the divergence and disagreement about notions of the learning organization, it is not unreasonable to assume that some participants had divergent or conflicting views of organizational learning, up to and including the possibility that they viewed organizational learning as non-existent. I was hopeful that, given the possible spectra of learning organization concepts, including simply defining organizational learning as an accumulation of instances of individual learning or knowledge management, that useful experiences (and therefore good data) were present. The goal of the study was not to confirm the existence of organizational

learning; rather, its overall purpose was to provide insight into what happens when a higher education institution undertakes an efficiency project or series of projects.

I have made the assumption that efficiency initiatives were conducted in a manner consistent with the use of Lean in academic settings. There are indicators in the literature that applications of Lean in non-industrial settings differ from its original intent and philosophical approach. Radnor and Boaden (2008) claimed that Lean is adapted rather than adopted in the public sector, applied to processes that it is not necessarily suited for, and may be considered simply as a set of tools and techniques rather than a fundamental shift in culture and approach. Radnor and Walley (2008) recommended that prerequisites or minimum conditions must be met in such cases, such as adopting a process-based view and linking improvement activities to strategy. Langer (2011) claimed that when Lean is implemented in higher education, the conceptual frameworks upon which it is based are less sophisticated than those used in manufacturing settings. Despite these concerns, the publications I examined regarding Lean in higher education allowed me to verify my assumption that standard practices regarding continuous improvement were followed at the research site.

Finally, I have made the assumption that study participants freely and openly shared information and insights about their experiences without worrying about how their contribution will influence their institution's stance toward future efficiency initiatives or their own career aspirations. I also assumed that participants would not use their contributions to the study as a means to unduly further their personal or professional agendas. All participants in an organization presumably have something to gain or lose depending on which initiatives the organization pursues; however, at some point a belief

in the research methodology and method, as well as some faith that those working for institutions truly wish to better these same institutions, must prevail. Interview methods that promoted anonymity in participant responses were a helpful factor in mitigating this concern.

Delimitations

This study related primarily to conceptualizations of organizational learning held by staff participants at a single university site; it did not include such conceptualizations held by members of senior administration, faculty or members of government. The study involved the use of interviews with some members of senior administration and staff members who planned institutional Lean projects; however, these discussions related more to context gathering and background information checking than addressing the research question itself.

The publications that I reviewed regarding the use of Lean methodology in post-secondary institutions suggested that the majority of efficiency initiatives involved staff members rather than faculty members or administration. Therefore, this study focused on the experiences with learning and Lean as reported by university staff members, allowing a rich description of associated cultural aspects and a useful comparison with literature.

Limitations

The intent of this study was not to provide results that are highly generalizable to other institutions. Given the uniqueness of post-secondary institutions in terms of culture, program offerings and funding requirements, it is difficult to claim that direct mapping would be possible for like institutions even within Canada, despite the fact that efficiency initiatives are commonly introduced at post-secondary institutions.

This study was limited by typical human factors, such as a reliance on the honesty and motives of the participants, including any incentives to participation that may exist. It was influenced by the organizational culture that is present in the institution as well as departmentally or by work unit. The ability for participants to recollect and recount their experiences must be considered as a limitation. Finally, the ability for participants to understand and interpret aspects of organizational theory and practices may serve as a study limitation.

Definitions and Participant Groups

To frame this study, it is important to provide some background and definitions related to the learning organization, organizational efficiency and Lean methodology. Definitions of participant types are also provided in this section.

The Learning Organization

Senge (1990) referred to the learning organization as "a conceptual framework, a body of knowledge and tools that have been developed over the past fifty years to make the full patterns clearer and to help us see how to change them effectively" (p. 7). A conceptual framework based upon this definition, but extended by Yang, Watkins and Marsick's (2004) flow-based model of organizational learning, is presented in the study's literature review.

Organizational Efficiency

Stone (2001) defined efficiency as the "ratio of an organization's inputs to its outputs" (p. 61). In this study, inputs refer to any specific material, financial or human resource assets applied to an efficiency project. Outputs and objectives can be mapped or assessed by project or organizational outcomes.

Lean Methodology

Lean methodology aims to reduce waste and inefficiency by eliminating work processes that have no effect on client experiences or product quality (Womack & Jones, 1996) while Lean methods include tools such as Kaizen exercises, value stream mapping and a variety of workplace efficiency tools (George, Rowlands, Price & Maxey, 2005). Lean *methodology* carries the philosophical assumptions that guide improvement while Lean *methods* are the tools used in a particular improvement project or series of projects.

Participant Types

There were two types of participants in this study:

1. Senior leaders (four in number, with oversight of budget and employees across multiple departments: typically a director role) and;
2. Unit leaders (three in number, with departmental responsibility for budgets and employee supervision: typically a manager role).

There were three, rather than four, participants in the unit leader group as it was determined for one of the projects examined that only a single participant was able to participate in the study.

Significance of the Study

Lean methodology has become prevalent in institutions of higher education as a means of enhancing organizational efficiency (Balzer, 2010; Finn & Geraci, 2012; Radnor & Bucci, 2011). Lean has been reported as effective in improving university and college administrative and academic procedures and practices (Comm & Mathaisel, 2005a; Doman, 2011; Emiliani, 2005; Flumerfelt & Banachowski, 2011) in post-secondary institutions worldwide.

Lean is highly complex and participatory (George, 2002; Liker & Franz, 2011), requires clear executive direction (Francis, 2014; Hines & Lethbridge, 2008), a culture of continuous learning (Dennis, 2007) and employee engagement from all levels of the organization (Moore, Nash & Henderson, 2007). This complexity and dependence on employees with varied academic and professional preparation suggests that organizational learning is an important prerequisite for successful Lean initiatives.

Universities and colleges seeking efficiency gains from Lean or similar methodologies must acknowledge that such initiatives are not simple ones and that a significant change of mindset and culture is required to promote success. Gardner (1999) reminded us that it is "never easy to bring about a change of mind; and it is even more difficult to replace a simple way of thinking about a matter with a more complex way" (p.92). Changes of this type require vision, planning and continuous intervention from an organization's executive leadership.

I have argued here and elsewhere that organizational learning is a necessary complement to Lean initiatives. However, conceptualizations of the learning organization have been chiefly studied from the perspective of organizational effectiveness. It is timely and appropriate to study conceptualizations of the learning organization in a higher education setting from the perspective of organizational efficiency rather than organizational effectiveness when examining the outcomes from Lean projects.

As described earlier in the chapter, a prevalence of studies regarding the learning organization related to how it effects or is influenced by organizational effectiveness. Given the parallels between commonly viewed paradigms of the learning organization (e.g., systems-based) and the engineering-focused Lean methodology, it seems a natural

point of inquiry to examine the experiences of those staff members with common training and professional backgrounds as it related to those who have recently worked on efficiency initiatives and how they view the learning organization.

This study gives voice to staff members who have worked diligently to improve their university both individually and collectively and, hopefully, provides interesting short-term and longer-term directions about how the learning organization can be used to leverage such efforts.

Structure of This Dissertation

This dissertation is presented in five chapters. This chapter provided an introduction, definitions, parameters and background material relating to this study. Chapter two presents a literature review about organizational learning, concepts of organizational efficiency and Lean implementations in higher education. The study's methodology and methods are presented in chapter three, along with the study's tools and ethical guidelines. Data are presented in chapter four with a view to provide a basic alignment with the study's research questions and conceptual framework. Finally, chapter five presents the study's themes and conclusions, as well as a discussion of the study's findings. Implications of the study as well as recommendations for further study are also presented in the final chapter.

CHAPTER TWO: LITERATURE REVIEW

Introduction

Theoretical and practical notions of organizational learning have been discussed in academic and trade publications for over 50 years. However, there continues to be disagreement about what constitutes organizational learning or instances of the learning organization (Barker Scott, 2011; Garvin, 1993), aside from a general consensus that organizational advantages are conferred from such learning (Bolman & Deal, 2008; Garratt, 1987). Literature about organizational learning is typically theoretical in nature rather than informed by research (Dodgson, 1993).

Organizational learning has been compared metaphorically to human learning, described through resultant organizational tensions or viewed through different frames, such as organizational strategy and systems theory. The systems view has been very influential in the literature as advanced by Senge's (1990) *Fifth Discipline*, where organizational learning was described as "a conceptual framework, a body of knowledge and tools that have been developed … to make the full patterns clearer and to help us see how to change them effectively" (p.7). The theoretical implications of this systems-based approach to organizational learning have not been empirically explored in depth (Bui & Baruch, 2010).

The proposed advantages of organizational learning are usually described in relation to how learning strengthens individual or collective capabilities to enhance organizational outcomes. These outcomes are typically expressed in the literature in terms of effectiveness and efficiency. This study focused on organizational learning through the lens of a series of efficiency initiatives at a Western Canadian university.

These initiatives employed Lean, an improvement methodology adapted from automotive manufacturing, to enhance the operations of certain administrative and support functions. Therefore, this study is reliant on theoretical concepts and the literature relating to *organizational learning*, *organizational efficiency* and the use of *Lean methodology in higher education*.

The literature reviewed in this chapter is presented in sections relating to these three main concepts. *Organizational learning* is presented from its theoretical origins leading up to the systems view that was used in this study. *Efficiency* is presented from its origins in the works of Weber and Taylor through wider conceptualizations, such as the notion of social efficiency and quality assurance methodologies. *Lean methodology in higher education* is presented categorically based on the types of studies that have been conducted and the results observed by institutions. Due to the number and diversity of sources dealing with organizational learning and Lean methodology in higher education publications, summary tables are presented at the end of those sections. Finally, the conceptual framework used in this study to synthesize the literature is presented.

Organizational Learning

The definitional origins of organizational learning are first presented in this section. Further metaphors and analogies (including the systems view) of organizational learning are presented in later sections.

Organizational Learning: Origins and Early Definitions

Arie de Geus, a former executive trainer with Royal Dutch Shell, is credited with originating the term learning organization (de Geus, 1988). His work with Shell led him to pursue research approaches to questioning knowledge-based corporate decision-

making. Of particular interest to de Geus was contrasting the decisions made by senior executives possessing company-level information with decisions based on input offered up and down the corporate hierarchy. He later described learning organizations as analogous to higher-order living entities with learning traits. He also claimed that organizations need to consider learning as equivalent to planning (de Geus, 1997).

Fiol and Lyles (1985) presented a view based on previous studies that there should be a clear distinction between organizational learning and organizational adaptation. Based upon aspects of systems theory, those who wish to study organizational learning need to consider the difference between changes in states of knowledge (which are not directly observable) and changes in organizational outcomes (which are typically observable) (Simon, 1969). These authors noted that learning itself has been defined in a number of ways in the literature, such as the acquisition of new insights or knowledge (Argyris & Schon, 1978), new structures (Chandler, 1962), new systems (Jelinek, 1979; Miles, 1982) or mere actions (Cyert & March, 1963).

Fiol and Lyles (1985) briefly defined organizational learning as the "process of improving actions through better knowledge and understanding" (p. 803). The authors presented contrasting concepts relating to organizational change and learning. They posited that during times of organizational change, different levels of cognition (e.g., high and low levels) and behavioural development are required to support outcomes from such changes. High levels of learning were described as nonroutine, requiring abstraction and strategic focus, while low levels of learning were used in well-defined, routine situations. If one accepts that organizational learning and change "may be two different processes" (Fiol & Lyles, 1985, p. 811), one can assess levels of an organization's capacity to learn

and respond to change. Building upon the theories of Argyris & Schon (1996) and Hedberg (1981), the authors claimed organizational alignment can be viewed as an organization's potential to "learn, unlearn or relearn based on its past behaviours" (Fiol & Lyles, 1985, p. 804).

Bolman and Deal (2008) described the tensions that exist between organizational and individual learning. They emphasized the prevalence in the literature of Senge's (1990) systems model of the learning organization and also noted that it is difficult for organizations to establish the relationship between learning cause and learning effect. They presented examples of such disconnects as proximity (did the learning affect improvement in another, distant part of the organization), time (how can we know if learning affected organizational results) or complexity (how can we be sure we have learned anything at all) (Bolman & Deal, 2008).

Levitt and March (1988) theoretically characterized organizational learning as "routine-based, history-dependent, and target oriented" (p. 319) by comparing an individual's learning capability to that of the organization. Just as an individual depends on routines for intelligent action, so does the organization. The parallels of learning by experience, learning by doing and a need for institutional memory are apparent and obvious, but complicated by the dispersion of organizational decision making. Learning can be held back by single-loop learning and competency traps (Argyris & Schon, 1996), defined as barriers to institutional learning for cases where established practice has been adequate to ensure basic success; therefore, there is no impetus to seek new learning.

Levitt and March (1988) further explained the nature of organizational learning through stories, paradigms and frames, as these structures formed a simulacrum of

experiences lived by the actors within an organization and enabled observers to form impressions of what is happening within the organization, whether they are part of it or not. The authors' use of frames mirrored Bolman and Deal's (2008) use of organizational frames (structural, human resource, political and symbolic), representing distinct lenses through which the organization may be viewed and better understood.

Levitt and March (1988) furthered the notion that defining success is ambiguous in organizational learning and that some learning can, in fact, be characterized as superstitious. An example of superstitious learning would be a manager who refuses to buy products from a certain company because of past experience or an impression that he or she has built up based on others' comments. The authors presented the concept of institutional memory as problematic, as individuals routinely join or leave organizations and not all experiences can be recorded or shared.

Levitt and March (1988) presented concepts from previous literature on how information moves within an organization. They established an interesting connection with DiMaggio & Powell (1983), who posited that organizational information sharing is coercive (commonplace as a competitive advantage), mimetic (copied from others) or normative (routine based on human interaction or a need for certain professional credentials). The concept of an institutional intelligence was presented by the authors and paralleled with notions of how an institution should be able to enhance its own learning capacity and intelligence.

Organizational Learning: Is it Indefinable?

Definitions of learning organizations have been highly divergent and elusive in the literature (Barker Scott, 2011). Garvin (1993) claimed that divergent definitions of

organizational learning are a product of a lack of "meaning, measurement and management" (p. 78). Nonaka (1991) claimed that it is possible to interpret organizational learning simply as the use of basic knowledge management within one's job responsibilities, while others (Mintzberg, 1983; Schein, 1996) conceptualized it in terms of organizational culture. Yet others (Wenger, 2008) framed organizational learning based on how it related to individual knowledge, job performance and how it relates to professional communities of practice. Information, especially information shared between individuals within an organization, has a "social life" (Brown & Duguid, 1991) with all of the positive and negative effects such a social life might imply.

Some authors have claimed that we must acknowledge a reality that defining organizational learning is not possible (Kim, 1993; Simon, 1991). Weick & Westley (1999) claimed that the term learning organization was, in essence, oxymoronic due to the disharmony of its constituent concepts, as "relationship between learning and organizing is inherently uncomfortable, a tension rather than a compatibility" (p.444). Despite this, Kim (1993) stated that "all organizations learn" (p.31) but the learning organization should be viewed in the metaphorical sense relating to how individuals learn. That is, learning organizations are really just a composite of the learning of the individuals in the organization. He claimed that since much work remains on how the human mind and learning function, the same is likely true of organizations, and there is a "missing link" (Kim, 1993, p.42) between individual and group learning as well as natural tensions between them (Antonacopoulou, 2006; Bolman & Deal, 2008). Kim (1993) argued that the use of models of organizational learning that focus excessively on

individual learning would result in, at best, "fragmented learning" (p. 48) experiences for the organization.

Simon (1991) applied his theoretical concept of a bounded rationality to delimit the learning organization. He considered organizational learning to be a highly complex, ill-defined phenomenon that is difficult to understand due to "limits upon the ability of human beings to adapt optimally, or even satisfactorily, to complex environments" (Simon, 1991, p. 132). Simon's earlier (1976) approach to rational decision-making (gathering intelligence, designing and choosing) was stated as fundamental to those seeking to develop the learning organization. The author introduced the concept of *satisficing* as a way to enhance decision-making; that is, ensuring good decisions by satisfying needs while making reasonable sacrifices along the way. Simon cautioned us that to relentlessly seek a strict definition for organizational learning could "define our topic out of existence" (Simon, 1991, p.125) and that it is important not to only consider organizational outcomes but to consider organizational efficiency when defining it.

Post-Secondary Organizations as Learning Organizations

Some authors have suggested that the nature of post-secondary institutions is antithetical to the concept of the learning organization due to their structure, culture, history and varied missions. For example, White and Weathersby (2005) argued that faculty members are trained and systematically rewarded and praised for individual learning and achievement rather than for benefitting the organization as a whole. Despite committee structures that favour governance of such institutions by staff and the professoriate, it is more likely that faculty members exhibit group learning and information sharing within their global research communities of practice than within their

own organizations (Drugovich, Saatcioglu & Bilimoria, 2004). It is a faculty member's responsibility to interact with and contribute to their esoteric and global fields of study and research (in addition to teaching and service), so this proposed disconnect may be unsurprising.

In another conceptual piece, Patrick and Aetcher (1998) noted that in their view, the systems view of the learning organization is likely the most appropriate one; therefore, post-secondary institutions are likely not classifiable as learning organizations as "the traditional academic framework consists of distinct disciplines, specialized research tools and isolated learning environments" (p. 160). The authors offered a way forward on the possibilities of using systems thinking as "institutions of higher education need to create or recover a common language focused on, for example, pedagogy, institutional missions, institutional goals, and, perhaps, the state of higher education itself in the information age." (Patrick & Aetcher, 1998, p. 160). The authors noted that if systems thinking is to become more prevalent in post-secondary institutions, each unit within the same organization would have to increasingly truly see itself as a part within the whole.

Espousing a more optimistic view of the university as a learning organization, Benjamin, Juda and Marcella (2008) reasoned that since faculty members desire to "explore new territory and to learn from these explorations, it seems likely that involvement in organizational learning would act as a significant motivator and satisfier within the workplace" (p. 292). Structures and culture that promote the learning organization are desirable for short and longer-term initiatives, however it is important that key leadership and organizational structures exist to support these enablers. The

authors proposed that strong executive leadership and exemplary human resources practices are additional keys to success for post-secondary institutions interested in enhancing their organizational learning capacity.

Lewis et. al. (2008) identified certain barriers to organizational learning in institutions of higher education. They noted, from the literature, such barriers to the development of learning in societal and organizational situations as fragmentation, reactiveness and competition. Fragmentation results in non-alignment of institutional goals, usually when individual needs take precedence over the needs of the group. Reactiveness focuses on directed problem solving over the possibility of creative, innovative solutions. The authors noted that competition in higher education settings might be manifested in ways that result in appearances (optics) being considered more important than actual measurable progress. Given this propensity, short-term goals and directives can take precedence over longer-term objectives if competition is viewed in ways that do not benefit people evenly.

Learning Organizations: Exploration and Exploitation

The literature about organizational learning contains several conceptual works that forward the notion that organizations must routinely decide between allocating resources used to develop new knowledge (exploration) versus drawing from resources that have been made available based on previously developed knowledge (exploitation). In for-profit or research-oriented firms, this would be expressed by a research and development (R&D) function, while in universities and colleges, this would be expressed as the development of original creative works or research (either pure or applied). A main difference between these organizational types is that universities and colleges typically

incorporate the creation of new knowledge as part of their mission while not all firms necessarily require this same function.

March (1991) produced foundational theory relating to the need to balance an organization's investment in exploration and exploitation of organizational learning. Organizations that invest excessively (versus their mission) in exploration activity may produce ideas or products that are either unnecessary or fail to adequately test new initiatives or assess their quality. Organizations that draw too heavily from previous innovations (versus their mission) may fall behind a required innovation curve for their industry and focus on short-term results over longer-term growth and organizational value. The tension between exploitation and exploration has been examined in the literature and has been referred to as a productivity-technology dilemma (Clark, Hayes & Lorenz, 1987).

Some researchers (March, 1991; Yeung, Ulrich, Nason & Von Glinow, 1999) have posited or demonstrated that organizations have a propensity to exploit their own resources (or familiar alternatives) versus the exploration of new or unknown resources. In the literature relating to post-secondary organizational planning, this has also been expressed by practitioners and researchers (e.g., Dickeson, 2011). Whether or not this propensity toward harvesting existing resources versus developing new ones would be strategically sound would depend largely on situational factors, organizational mission and the strategy of senior leadership.

Learning Organizations: The Systems View

The systems-based approach to conceptualizing the learning organization is influential and frequently cited in the literature (Caldwell, 2012; Ortenblad, 2007).

However, the theoretical implications of the systems-based approach have not been empirically explored in depth (Bui & Baruch, 2010). This study provides one step to enhancing available research regarding the systems-based view of organizational learning.

Nevis, DiBella and Gould (1995) employed a research-based approach to studying organizational learning by observing corporations. Rather than question the existence of organizational learning, these authors proposed a systems framework based on an organization's "learning orientations" (the dimensions by which learning occurs) and its "facilitating factors" (processes that aid organizational learning). The authors identified the key facilitating factors as well-developed core competencies behind products and services, an incorporation of continuous improvement in the business and the ability to renew or revitalize services and products (Nevis, DiBella & Gould, 1995). They also claimed that, based on Huber's (1991) theory, organizational learning occurs over three stages: knowledge acquisition (creating skills, insights and relationships), knowledge sharing (sharing what has been learned) and knowledge utilization (the integration of learning so the learning can be shared and applied to new situations).

Based on their observations, Nevis, DiBella and Gould (1995) made a series of claims along certain themes. They claimed that learning occurs in all organizations, albeit not necessarily in a linear or predictable fashion and learning aligns to and conforms to organizational culture. Organizations, like people, have learning styles, and there are ways to optimize an organization's propensity to learn by acknowledging this. Despite a diversity of learning styles, there are generic means by which all organizations can learn. In terms of learning orientations, the authors noted that organizations must sense and

develop areas where knowledge emerges from and consider how products and product development processes are documented. They must also consider how knowledge is shared along with areas of focus for organizational learning, assess the value of processes related to service or product delivery and encourage overall skill development.

Nevis, DiBella and Gould (1995) enumerated some facilitating factors of organizational learning as follows: organizations should continually scan environments, assess performance gaps, consider suitable measurements and maintain a mindset ready for experimentation. Additionally, organizations must foster a culture of openness and a commitment to continuing education, recognize there are a variety of methods for operations and ensure multiple advocates for organizational learning including involved leadership. Organizations need to take a clear systems perspective to learning; in other words, managers must ensure they consider all areas of the organization during all decision-making and avoid unintended consequences from that same decision-making.

Perhaps most representative of the systems view of the learning organization in the literature, Senge (1990) set out five component technologies (disciplines) that are required for organizations to truly be considered as learning organizations. He defined systems thinking as the *Fifth Discipline*, the master discipline that ties the others together, calling it "a conceptual framework, a body of knowledge and tools that have been developed over the past fifty years to make the full patterns clearer and to help us see how to change them effectively" (Senge, 1990, p. 7). He provided examples about how systems thinking related to the learning organization and how this implied that high levels of complexity must be considered and managed when implementing or assessing organizational learning initiatives.

Senge and Goleman (2014) extended the notion of a systems approach to individual and organizational learning to the affective domain. In terms of early child education, the authors promoted the teaching of a focus on academic material as well as self-awareness and empathy. By better understanding themselves, students would demonstrate better individual and group academic goals. The authors promoted the concept of developing a better understanding of our role within a larger world. This role, in turn, makes us part of a larger system relating to our personal and family relationships and the type of networks within we operate professionally or academically. Senge and Goleman (2014) claimed that the systems view is innate to learners of all ages and therefore can be fostered at any stage of the educational journey.

Yang, Watkins and Marsick (2004) published a critical review of organizational learning literature and presented an instrument to describe the dimensions of a learning organization, measure the degree of an organization's capacity for learning and validating results. Their systems-based conceptual framework about organizational learning was based on the work of Senge (1990), but differed in the sense that it showed a delineation of individual and group learning and suggested a necessary flow from individual learning experiences to those of groups. The authors claimed that since organizational learning defies a common definition, there are special requirements to the development of an instrument to assess it. The authors referenced Cronbach and Meehl (1955) who claimed that a "nomological net surrounding the concept must exist" (p. 291) for such situations. A nomological net served to ease inquiry through the development of structures where "at least some of whose laws involve observables" (Cronbach & Meehl, 1955, p. 290).

Learning Organizations: The Five Disciplines

Senge (1990) set out the component technologies (or disciplines) that are required for organizations to truly become learning organizations as systems thinking, personal mastery, mental models, shared vision and team learning. He defined systems thinking as the *Fifth Discipline*, the discipline that ties the others together, resulting in organizational settings where "people continually expand their capacity to create the results they truly desire, where new and expansive patterns of thinking are nurtured, where collective aspiration is set free, and where people are continually learning how to learn together" (Senge, 1990, p. 3).

The following is a set of brief explanations regarding these component technologies or disciplines.

Personal mastery. Senge (1990) stated that even though individual learning is not equivalent to organizational learning it does serve as a necessary condition for organizational learning; without the phenomenon of individual learning, organizational learning would not be possible. However, this first of Senge's component technologies encompassed more than an individual's desire or willingness for learning new things in the workplace. Rather, he called it a commitment to personal growth and improvement over a number of areas, whether they are areas of one's professional capacity, spiritual life or integration within one's community. To gain personal mastery, one must "approach one's life as a creative work, living life from a creative as opposed to reactive viewpoint" (Senge, 1990, p. 141).

Senge (1990) differentiated learning that is generative from learning that is adaptive. Generative learning results in new (exploration-based) opportunities for an

organization while adaptive learning is reactive to external opportunities or threats. Personal mastery is the vehicle by which one can engage in both types of learning and manage the tension resulting from allocating scarce learning resources to each area. The author noted the natural tension that results from reflective activity that indicates an individual's vision of where they would like to be versus the reality they currently experience. This tension is natural and therefore, if managed, can be highly motivational to an individual's learning strategy and efforts.

According to Senge (1990), organizations can encourage personal mastery by developing and maintaining a climate where "it is safe for people to create visions, where inquiry and commitment to the truth are the norm, and where challenging the status quo is expected, especially when that status quo includes obscuring aspects of current reality that people seek to avoid" (Senge, 1990, p. 172).

Mental models. Senge (1990) proposed that individuals and organizations use mental models as a means of representing varied realities relating to the functions of an organization and its constituents. Irrespective of the complexity level of a worldview, there are differing thoughts, representations and even attitudes about this worldview. The use of mental models allows organizations and individuals to jointly develop meaning, communicate and actively seek approaches that benefit the organization and stakeholders.

Senge (1990) drew from theory about mental models when proposing it as a component technology or discipline in his framework for organizational learning. In particular, he drew upon Argyris and Schon's (1978) work on identifying the difference between an espoused theory and a theory in use; that is, identifying gaps between what we believe an organization is doing versus the theories behind the actions of that

organization. Senge (1990) noted that mental models that are deeply entrenched or inflexible are diametrically opposed to the concept of systems thinking. Mental models should be considered "systematically flawed" (Senge, 1990, p. 203) as implied by Simon's bounded rationality theory and limitations of systems models.

Shared vision. Senge (1990) claimed that shared vision refers to the common individual, group and organizational aspirations held about what an organization is or should be doing. Senge (1990) claimed it provides the "focus and energy for learning" (p. 206). Adaptive learning might be possible in absence of shared vision, but in that case generative learning will not be possible. Senge (1990) noted that shared vision starts with the encouragement of individual vision: and it is these strong individual visions that lead to the possibility of a shared vision.

The propagation of shared vision within an organization follows the steps of enrollment, commitment and compliance. Enrollment refers to the introductory and individual step of deciding that one is ready to get behind a vision whereas commitment means that an individual begins to feel responsible for making the vision into reality. Compliance refers to the actions of an individual as they relate to seeing the benefits of the vision and doing as much as they can to support it. Senge (1990) distinguished between genuine compliance (where an individual's efforts would meet or exceed expectations) and grudging compliance (where an individual efforts would typically minimally meet expectations).

Team learning. Senge (1990) noted that team learning referred to more than the aggregate learning activity of team members; it is the organizational alignment required to ensure individuals and teams are learning the most appropriate things and sharing them

as well, moving toward a systems approach to overall organizational learning. Team learning, employed well, helps organizations overcome some of the natural pitfalls of all teams. He drew key examples from the literature to support this position. For example, Argyris (1985) introduced the problem of defensive routines as a barrier to productive dialogue and group discussion. Other supporting theory was presented with the view that the development of new science is an ongoing dialogue, facilitated by the suspending of assumptions, a collegial framework and a defined means of encapsulating conversations.

Systems thinking. Senge (1990) argued that the five disciplines of the learning organization must be considered as an ensemble rather than isolated tools; they must be implemented as a system in order to ensure the sum of the learning organization's efforts exceeds the sum of its parts. He claimed that systems thinking is the discipline that "integrates the disciplines, fusing them into a coherent body of theory and practice" (Senge, 1990, p. 12). It required a shift of mind, or *metanoia*, on the part of individuals and groups seeking this approach. This shift of mind allowed us to most accurately perceive the gap between what we collectively need to know as an organization and our learning abilities and requirements for further learning.

Organizational Learning: Summary of Literature

The literature about organizational learning is varied in terms of themes, nebulous in its content and spans multiple decades. The following table is presented to summarize the various definitions and views of the learning organization referenced in the previous sections. Article references are presented alphabetically (by author or first author).

Table 2.1

Summary of Literature About Organizational Learning

Author(s)	Year	Format	Nature of Publication
Bolman & Deal	2008	Book	Explained tensions between individual and group learning, as well as cause and effects within the organization.
Brown & Duguid	1991	Book	Information, especially information shared between individuals within an organization, has a "social life".
de Geus	1997	Book	Originated term "learning organization" explaining they are analogous to higher-order living entities possessing learning traits. Organizational planning should be considered equivalent to learning.
Fiol & Lyles	1985	Research article	Argued there is a difference between organizational learning and adaptation. There are different levels of learning, each with a different effect of organizational strategy.
Garvin	1993	Research article	Divergence in organizational learning definitions issue due to a lack of meaning, measurement and management.
Kim	1993	Research article	Organizational learning should be considered analogous to individual learning. There is a missing link between individual and group learning.
Levitt & March	1988	Research article	Organizational learning as routine-based, history-dependent, and target-oriented. The nature of organizational learning can be described through stories, paradigms and frames.
Lewis, Benjamin, Juda & Marcella	2008	Research article	Universities can be viewed as learning organizations if good culture and strong executive support is present.
Huber	1991	Research article	Organizational learning can be explained through knowledge acquisition, sharing and utilization in new situations.

March	1991	Research article	There are differences between exploration (new discoveries) and exploitation (drawing from previous discoveries) in organizational learning.
Nevis, DiBella & Gould	1995	Research article	Claimed organizations are learning systems. Organizations, like individuals, have defined learning styles and learning orientations. Organizational learning conforms to culture.
Patrick & Fletcher	1998	Research article	Systems view of learning organization is apt; however, universities are typically not structured to benefit from systems approaches.
Senge	1990	Book	Proposed a systems view of the learning organization through five organizational disciplines required for the systems (fifth) discipline to be effective.
Senge & Goleman	2014	Book	Proposed the teaching of academic focus along with a focus on self-awareness and empathy for students. Claimed that a systems view is innate to students.
Simon	1991	Research article	Avoid excessive stricture of definition about organizational learning. Outcomes and efficiency should be considered when studying organizational learning. Organizational learning is an ill-defined problem subject to bounded rationality.
Wenger	2008	Book	Learning organizations should be viewed as communities of practice.
White & Weathersby	2005	Research article	Universities and the learning organization are not compatible since faculty members are not incented to focus on group learning over individual achievements.
Yang, Watkins and Marsick	2004	Research article	Used nomological network to measure the impact of the learning organization based on Senge's five disciplines.

Organizational Efficiency

Organizations have sought increased efficiency for as long as they have existed. The production of materials more quickly at a lower cost, while ensuring an acceptable level of quality, clearly provides organizational advantages. Seeking efficiency also allows an organization to pursue more of its goals with fewer resources. Barnard (1938) offered a bridge in the literature between organizational efficiency and effectiveness. He viewed effectiveness as the ability of an organization to accomplish certain goals and defined efficiency as the degree to which the organization can satisfy the motives of its members (Barnard, 1938). Therefore, efficiency is a necessary, but not sufficient, component of organizational effectiveness. The definition of efficiency used in this study is the "ratio of an organization's inputs to its outputs" (Stone, 2011, p. 61).

Weber (1947) and Taylor (1911) undertook early studies of efficiency, focusing on the concepts of bureaucracy and workflow, including how they should most effectively be managed. Later views of efficiency conceptualized it from a social efficiency perspective (Knoll, 2009), considering not only the overall productivity of people and organizations, but also possible societal gains as new efficiencies are pursued.

Weber: Efficiency from a Structural Perspective

Weber (1947) produced early theory on the nature of professional bureaucracies. His work was rediscovered after World War II (Bolman & Deal, 2008) and used to enhance theory about why organizations choose different forms of organizational structures. Weber's view was chiefly concerned with "calculability and predictability" (Stanford Encyclopedia of Philosophy, n.d.), espousing a positivist view where organizations should be structured as command-and-control, top-down hierarchies to

create production efficiencies. He believed that capitalism provided a mode of economic life best suited for this rational approach, and his idea of a monocratic bureaucracy featured a fixed division of labour, a hierarchy of offices, a set of rules governing performance, a separation of personal from official property and rights, and an emphasis on technical qualifications for selecting personnel and employment focused on establishing long-term careers (Bolman & Deal, 2008, p.48).

Taylor: Efficiency from a Scientific Perspective

Taylor (1911) advocated the use of work teams for efficient co-operation rather than simply advocating the development or hiring of strong individuals in industrial settings. He summarized this approach by noting, "in the past, man has been first; in the future the system must be first" (Taylor, 1911, p. iv). His call to action was based upon contrasting the existing management practices of the day (ordinary management) with practices that would have to be adopted to gain a better national efficiency. His approach to organizational management is referred to as *Taylorism*.

Taylor's (1911) approach emphasized metrics and repeated analysis to ensure that all workplace actions pay maximum efficiency dividends. This was assessed through the observe - measure - analyze - change cycle that parallels aspects of the modern scientific method. Taylor deconstructed routine tasks in order to "get the most from each action and every second spent at work" (Bolman & Deal, 2008, p. 48). He believed scientific management was superior to other forms of management as it featured "science not rule of thumb, harmony not discord, cooperation not individualism, maximum output in place of restricted output" (Taylor, 1911, p.74). Collective output was emphasized even while

developing "each man to his greatest efficiency and prosperity" (Taylor, 1911, p.74), therefore balancing group and individual needs.

Alternatives to Industrial Methods: Social Efficiency

Efficiency has been conceptualized not only in terms of the overall productivity of people and organizations, but how societal gains might be realized (Knoll, 2009). Kidd (1894) claimed that while it is natural for individuals to seek economic advancement in ways paralleling the competition of natural selection, a sense of social efficiency might guarantee wide societal advances over those of the individual. However, expressing a more balanced view, Dewey (1971) claimed ongoing progress cannot be considered true progress if the needs of the individual are continually sacrificed to the needs of the group.

Organizational efficiency has been examined critically in works such as *Education and the Cult of Efficiency* (Callahan, 1962) and *The Cult of Efficiency* (Stein, 2001). These works posited that there is typically a trade-off between efficiency and an organization's core values. Referring to the public sector, Stein (2001) noted that we must manage "controversies about health care and education: balancing efficiency and accountability, rights and choice, to construct the public good" (Introduction).

Quality: Holding Efficiency to Account

Quality has been defined in divergent ways in the literature. The origins of definitions of quality come from European guilds and the Industrial Revolution (American Society for Quality website, n.d.). However, quality has been more formally defined in the modern age through the onset of World War II and the planning aspects of post-war Japan (American Society for Quality website, n.d.). Quality was eventually

referred to as total quality management (TQM); however, this term peaked in interest and practice in the early 1990's (Ehigie & McAndrew, 2005; Hawks, 2000).

Deming (1982), Juran (1951) and Shewart (1931) were consulted during efforts to rebuild post-World War II Japan. Deming pointed out that while American organizations believed "quality and production are incompatible" (Deming, 1982, p.1), the enhancement of quality is the most direct path to reducing production costs. Deming's theory of management is based on guiding principles for transformation. He presented the concept of specific organizational "diseases" and obstacles that are typically found in Western management that can be avoided by following his guiding principles.

The contributions of Shewart (1931) were thought to have formed the first historical basis for the application of statistics to the manufacturing process. Juran (1951) emphasized the need for the continued training of organizational middle and senior managers to ensure quality. Along with Deming, Juran emphasized the negative impact on results for organizations that fail to focus on product quality. He established a concept called the "Juran Trilogy" that was comprised of the phases of quality planning, quality control and quality improvement that organizations should follow to ensure an iterative approach to organizational improvement (Whaley, 2003). He also brought the idea of quality circles to the United States from Japan; groups of 5-15 people that were assigned to address issues of quality and quality improvement in an organization.

Crosby (1979) defined quality simply as "conformance to requirements" (p.15). Crosby argued that the enhancement of product quality pays enough direct and indirect dividends to fully fund quality initiatives. Crosby differed significantly with Deming (1982) by promoting the concept of zero defects in manufacturing. Crosby's basic

definition of quality was later refined as that "which meets or exceeds customer expectations" (Parasuraman, Berry & Zeithaml, 1991, p.41).

Lean Methodology as a Means of Efficiency

Lean methodology aims to reduce waste and inefficiency by eliminating work processes that have no effect on client experiences or product quality (Womack & Jones, 1996) while ensuring a strong respect for the workforce through employee engagement (Ohno, 1988). It is worth considering the difference between Lean methodology and Lean methods. Creswell and Plano Clark (2007) claimed methodology carries "philosophical assumptions that guide the direction of the collection and analysis" (Creswell & Plano Clark, 2007, p.5) while method focused on doing the work and following the appropriate research steps over a "single study or set of studies" (Creswell & Plano Clark, 2007, p.5).

A similar understanding of Lean can be developed where Lean methodology carries the philosophical assumptions that guide improvement while Lean methods are the tools used in a particular improvement project or series of projects. In this work, where Lean is simply used by itself, it refers to both Lean methodology and the Lean methods used to promote organizational improvement.

Lean methodology is one instance of a continuous process improvement approach. Continuous process improvement (CPI) refers to the organizational undertaking of practices and tools needed to establish and maintain a focus on process improvement (Liker, 1999). In the literature, Lean is occasionally combined with Six Sigma as a methodology referred to as Lean Six Sigma (George, 2002). Six Sigma as a methodology aims to reduce variations in product quality and provide an improvement scheme for managing (Motorola University Website, n.d.).

Lean Methodology: History and Antecedents

Womack, Jones and Roos (1990) presented the story of Lean production in a historical context. The authors contrasted Lean with mass-production automotive production methodology developed in North America and Europe. Mass production had been the dominant model throughout the 20th century, but reached certain limits due to factory practices and organizational culture. Henry Ford had made strides in automotive production in the early 20th century by ensuring a high degree of interchangeability of parts and by introducing the assembly line in 1913 (Sorenson, 1956). In terms of training and developing workers, Ford moved from a model where workers developed skills across a number of areas to a division of labour whereby each employee focused only on a single task, such as turning a bolt or affixing a single part repeatedly. Administrative control was highly centralized at Ford, with top-down decision making being the norm on all aspects of design and production. Ford's approaches and improvements to the manufacturing process have been termed *Fordism*.

Mass production remained the dominant model of production until 1955. From 1955 on, the market changed: mass production was no longer a competitive advantage as its use was commonplace across the world, and new vehicles were emerging from the Japanese market with higher levels of quality and more diverse features and brands than offered by U.S. and European manufacturers. Lean methodology was credited with allowing this competitive advantage to appear (Womack, Jones & Roos, 1990).

As a methodology, Lean can be thought of as having five main steps: specifying customer value by gaining a better understanding of their requirements, identifying the value stream for each product or process providing that value (while eliminating waste),

ensuring product or process flow, standardizing best practices, introducing "pull" between all steps to ensure continuous flow (since materials are only produced when they are requested by customers) and managing toward perfection in quality and delivery time to customers (Womack & Jones, 1996).

Lean has been used in service industries such as health care and education. The approaches are modified somewhat as neither industry represents a manufacturing discipline, but historically problematic administrative areas (typically high transaction or multi-stage processes) have been addressed by the methodology. In the case of hospitals, improvements in how patients are processed and released have been simplified, while in higher education, there are a number of administrative functions that have been similarly eased. References from the literature suggest that Lean was first applied in healthcare settings, and later to institutions of higher learning (Radnor & Boaden, 2008). Business schools within universities were in turn earlier adopters of Lean than whole institutions (Radnor & Bucci, 2011).

Lean Methodology in Higher Education

A number of recent publications exist relating to Lean or other continuous improvement methodologies as they have been applied to institutions of higher education. Related books, articles and monographs are presented in this section, most of which relate to Lean initiatives and the effect these initiatives have had on organizations. Literature is presented grouped according to which level of the organization was studied. The groupings are *institutional* level (a whole institution or educational system), *department* level (a school or department within an institution) or the *individual* level

(referring to the experiences of people or a group of people in a grouping such as a class of students led by a faculty member).

Lean in Higher Education: The Institutional Level

Antony (2014) described factors that would signal institutional readiness to take on organizational improvements using Lean. The author described these factors as *leadership and vision*, *linking improvement to the university's strategy*, *establishing a customer focus* and *selecting the right people*. Antony (2014) suggested that a wise institutional starting point for Lean would be the basic improvement of administrative procedures. The improvement of strategic policies and practices would then be addressed after the organization learns more about Lean and positive results are demonstrated elsewhere within the institution.

Antony, Krishan, Cullen and Kumar (2012) examined challenges, barriers, success factors and tools used for Lean and Six Sigma implementations in UK universities. The authors claimed that these two improvement methodologies are powerful when used together, despite the fact that Lean implementations were more commonly found in their observations. They argued that process improvement methodologies, while found primarily in industrial settings, could produce great value for the critical success factors measured in the higher education sector. The authors suggested further empirical study would be useful in this regard.

Antony, Krishan, Cullen and Kumar (2012) described several issues regarding the implementation of Lean and Six Sigma. Specifically, they identified disconnects between the terminology used in industrial settings and universities and the propensity for university issues to be dealt with locally ("siloing") as problems. In their view, executives

frequently misunderstand Lean and Six Sigma and therefore cannot provide the necessary management support or provide visionary leadership. Lean can be viewed as a "quick fix" mechanism or a means of cutting budgets, which is contrary to its central tenets. The authors claimed that process thinking is not always part of university culture, and the same culture does not necessarily foster openness and trust. There are many examples of misunderstanding a university's clients (notably, the needs of students). Finally, endemic communication, staff training and time constraints experienced individually or collectively presented a serious barrier to Lean implementations.

Antony, Krishan, Cullen and Kumar (2012) suggested a consideration of critical success factors as a means of enhancing the success of continuous improvement projects at universities. They enumerated these as: uncompromising top-management support and commitment, effective communication at all levels vertically and horizontally, strategic and visionary leadership, developing organizational readiness/institutional resources and skills, prioritizing projects and considering organizational culture. Finally, the authors identified specific Lean and Six Sigma tools that they believed would be best suited to the higher education sector.

Balzer (2010) conducted a series of investigations about Lean implementations in colleges and universities and provided practical advice, case studies and theory about how Lean should be implemented. He provided a specialized, tailored definition for Lean in higher education (termed "LHE") as:

> Defining the value of the process from the perspective of beneficiaries, identifying process flow (from beneficiary and provider perspectives, to determine whether and how each step and activity in the process adds value),

> eliminating the many types of waste that add no value to the process, making the process flow smoothly, with activities or services 'pulled' as needed by the beneficiary rather than 'pushed' by the provider and pursuing perfection through a combination of continuous improvement and radical transformation of the process (Balzer, 2010, p. 25).

Balzer's (2010) definition aligned with models found in the Toyota Production System (TPS) as expressed by Womack and Jones (1996); however, he did place an enhanced emphasis on the concept of flow. He pointed out that even Toyota itself did not officially establish a list of Lean principles (Balzer, 2010, p. 20) despite the fact they have been detailed at length in other related publications. He relied extensively on Womack, Jones & Roos (1990) for source definitions about Lean. The author provided case studies with examples accompanied by flow diagrams that noted, for each example, where processes broke down in terms of wasted material or wasted time. He highlighted where Lean could be effective in improving commonly found functions on campuses that can be viewed as highly inefficient (i.e., student enrolment, the student move-in process for residences and changes to the physical plant).

Balzer (2010) studied best practices in terms of establishing an administrative structure to support LHE and the required cultural considerations and sustaining efforts. Full descriptions of LHE case studies were provided for initiatives at the University of Central Oklahoma, the University of Iowa, the University of New Orleans, Bowling Green State University, University of Scranton and Rensselaer Polytechnic Institute (RPI). The author concluded that LHE was very successful for the improvement of processes in areas of universities and colleges that were well suited for Lean (i.e.,

administrative units and high transaction areas). LHE requires cultural sensitivity and willingness for employees to work across different departments and administrative levels.

Clayton (1995) investigated institutional changes at Aston University in the UK, where a total quality management (TQM) approach was converted to a Kaizen approach. Initial TQM quality efforts focused on academic restructuring, corporate identity, physical restructuring, advanced academic support services/focus on customer care and an ability to attract and retain high caliber staff and students. The university governed its quality initiatives via a quality council that defined quality as understanding customer values, developing precise specifications for products and services, an ability to deliver products or services exactly to the specifications and the ability to improve the specification or reduce the cost to the customer faster than the competition.

Clayton (1995) found that the quality council mapped "top level" processes (i.e., key service delivery) in relation to the university's mission and how quality circles could help improve these processes. Quality improvement projects (QIPs) were then defined by the council along with critical success factors for each. A university-wide education effort was launched, focused on an overall awareness of quality as well as knowledge provided about each of the various quality improvement tools. The author concluded that the approach produced required dividends for the university by maintaining balanced financial performance, achieving planned growth, improving research performance, promoting a shared sense of purpose, improving teaching/learning performance, recruiting/retaining outstanding staff and maximizing benefits from its IT infrastructure.

Comm and Mathaisel (2000) proposed a framework to benchmark Lean initiatives in public sector institutions. Adapting an existing framework, they claimed that the

following steps would be suitable for use in any industry: building the Lean consortium, targeting potential stakeholders, deciding on the research agenda, testing the research approach, benchmarking (finding the "best in class" practices), analyzing and assessing findings, implementing the concepts and establishing controls to see if desirable results are achieved (Comm & Mathaisel, 2000). The authors described the managerial support required of this approach, noting that organizations must be willing to experiment with new techniques and learn from this experimentation.

Comm and Mathaisel (2003) claimed that the presence of Lean in non-industrial settings, such as universities, has increased due to a need to compete at a global level, rather than a national or regional level. Metrics (such as Kaplan and Norton's (1996) balanced scorecard) are useful in order to establish quality standards and are particular to areas of the enterprise related to customer perspective, internal perspective, people and the financial perspective (Kaplan & Norton, 1996). Similar to Balzer's (2010) advocated approach, the concept of value stream mapping is recommended to analyze areas that can be improved via Lean. The authors proposed a Lean enterprise framework based on nine operating principles adapted from Nightingale (1999). They concluded that, in an era where expectations of post-secondary education have increased, the use of clear metrics and an analysis of customer (i.e., student) expectations were essential to ensuring institutional improvement.

Comm and Mathaisel (2005a) presented results from case studies at a number of New England universities that implemented Lean. The authors pointed out that no established measurement technique existed in post-secondary education (with the exception of a "per-student cost") at that time. The authors distributed a questionnaire to

administrators at five public and fifteen private universities that had implemented Lean initiatives. The themes in the questionnaire related to degree of sustainability achieved, degree of Leanness achieved, specific Lean improvements/initiatives/best practices (including collaboration and outsourcing), factors that encourage/discourage Lean operations, communication of best practices and the application of the overarching principles.

Comm and Mathaisel (2005a) presented their results as Likert scale averages, differentiated for public and private schools. Researcher observations accompanied each section. Observational trends related to a respondent's sense of the impact of Lean initiatives, the importance of the involvement of senior leadership in such initiatives and the use of measurement in a climate of fiscal restraint for universities. The authors noted that at some schools, improvement projects were not necessarily known as Lean initiatives and technology use had a significant impact on overall improvement. Lean projects do not necessarily emerge automatically and require the sponsorship of the most senior administrators (i.e., presidents and chancellors) to be successful and sustainable.

Comm and Mathaisel (2005b) presented an exploratory study of the best practices on the use of Lean methodology in higher education. They employed the same New England post-secondary institutions and participants for data collection. Their survey consisted of six open-ended questions:

1. What changes, if any, in the college/university environment have taken place over the past few years that will have an impact on the institution's sustainability?
2. In what cross-institutional and cross-departmental initiatives does the college/university participate?

3. What operations does the institution outsource?
4. Describe any sustainability processes that you feel this institution does better than anyone else. Based on the above answer, can you please share how these processes, or strategies, are communicated to the entire program?
5. Are there specific best practices used to encourage Leanness in your institution? If so, how does your institution communicate these best practices to the community?
6. Are there any specific implementation strategies that did not succeed and why? (Comm & Mathaisel, 2005b)

Comm and Mathaisel (2005b) presented basic themes from survey responses which indicated that Lean initiatives were potentially efficacious in the view of the college administrators surveyed, and are best implemented by training employees about Lean concepts, applying Womack and Jones's (1996) five principles, defining appropriate metrics for success and continuing to develop outsourcing, collaboration programs and technology initiatives (Comm & Mathaisel, 2005b).

Flummerfelt and Banachowski (2011) conducted a qualitative study in which they asked higher education administrators to identify their areas of greatest concern relating to organizational improvement initiatives. They presented administrators with surveys developed with concepts derived from total quality management (TQM), the Baldrige National Quality Program Education Criteria and information from Lean Thinking for Schools (Pawley Lean Institute, 2011) as they related to improvement projects. This process resulted in a survey that sought to examine 20 leadership "paradigms of concern" (Flummerfelt & Banachowski, 2011, p. 228.) that administrators would typically face when undertaking improvement initiatives.

Flummerfelt and Banachowski (2011) found that the six highest ranked paradigms of concern for administrators were: allocating scarce resources, analyzing the root causes of problems, attending to group dynamics, clarifying roles and responsibilities, confronting ambiguity and maximizing communication. Of these paradigms, there were high correlations between analyzing root causes, attending to group dynamics and confronting ambiguity. The authors noted that organizational learning (or in fact unlearning in some cases) would be required to enhance the capabilities of administrators and institutional staff concerned with the oversight of improvement projects. They correlated results with different areas of literature about organizational development, such as Bolman & Deal (2008) and Bryman (2007). In particular, they noted that their top paradigms of concern would be well addressed by Bryman's (2007) advice that administrator must avoid "failing to consult, not respecting existing values, actions that undermine collegiality, not promoting the interests of those for whom the leader is responsible, being uninvolved in the life of the department or institution, undermining autonomy and allowing the department/institution to drift" (p.2).

Langer (2011) conducted a multiple case study involving three universities in the United Kingdom that implemented Lean as a means of increasing the effectiveness of their business operations. Reports about each of the universities were done in an anonymous fashion; each institution was large, however, with enrolments typically exceeding 15,000 annual registrations. The study featured a methodology that reported the results categorically for each institution and compared results to a framework that conceptualized the use of Lean in higher education based on what the author found in the literature.

Langer (2011) claimed that, based on obtained data, the results of Lean in higher education were less efficacious that those reported in the manufacturing sector. This was thought to be due to two factors:

1. The collegial nature of university management can prevent active, ambitious leadership that encourages change initiatives. The author noted that higher education, with less exposure to the external pressures or competition as would be found in the corporate world, is often measured with so-called "soft non-quantified targets and only fragmented implementation" (Langer, 2011, p. ii);
2. The conceptual framework upon which Lean in higher education is implemented is less sophisticated than what is used in manufacturing settings (Langer, 2011).

This qualitative study employed a number of diagrams and charts to demonstrate both what the conceptual framework of Lean in higher education would look like as well as a visual representation of what each university was seeking to achieve by implementing Lean methodology. There are numerous examples of the author giving voice to the study's participants by using direct quotations from the semi-structured interviews conducted during the data collection phase.

Hines and Lethbridge (2008) published an article that described the efforts of the Lean Enterprise Research Centre (LERC) in the UK, a centre of expertise with the goal of applying Lean methodology to academic environments. To describe best practices in the use of Lean at universities, the authors conducted semi-structured interviews at university sites where they were involved with improvement projects. They corroborated these results by collecting secondary data from similar institutions pursuing improvement

initiatives, most of which came from peer-reviewed publications describing such initiatives.

Hines and Lethbridge (2008) proposed that successful university Lean implementations would be highly participatory, in sharp contrast with a typical approach to change initiatives that are "top-down" or involve only a few key decision makers. In their view, Lean initiatives should be viewed metaphorically as an "iceberg", where the visible (above water) components relate to processes, technology, tools and techniques and the enabling (below water) components are strategy and alignment, leadership and behaviour and engagement. Lean initiatives should not only focus on the reduction of waste, but the three areas of improvement proposed by the Toyota Motor Company as reducing muda (waste), mura (unevenness) and muri (overburden).

Hines and Lethbridge (2008) detailed a number of factors of success for Lean initiatives based on their work at one particular university site. Establishing a correlation between proposed projects and the institutional strategic plan was stated as highly important. When declaring the areas of the institution to improve, these should be communicated clearly to stakeholders in order to enhance the probability of overall employee engagement. Project titles can relate to wider institutional goals, stated at the client university site as ensuring a "modern working environment" and a "positive working environment". Some cultural aspects were noted, such as a reluctance of some staff members to consider the term "customer" when working on areas of customer service. The authors concluded that while there is much potential to improve value to the clients of universities, it can be difficult to implement due to a number of cultural factors, the most prominent of which is an institutional reluctance to implementing wide-scale

change initiatives. They offered that such change initiatives, to be successful, require a high level of engagement of faculty and employees.

Sinha and Mishra (2013) described nationwide changes in the higher education sector in India as it related to the possibilities for improvement offered by continuous improvement approaches such as Lean methodology. Despite a 17% increase in funding for higher education, India is continuing to address quality concerns in its higher education sector as noted by a number of industry groups and government itself. These authors expressed support for identifying categories of inefficiency as a first step based on models developed by manufacturing organizations (such as Toyota). Further, they recommended changes would refine overall systems (to reduce or eliminate rework and make information easily available), workforce training (to make methods and procedures prevalent), collaboration with peers (to compare best practices) and training for students in Lean principles and practices to enhance the future workforce.

Sinha and Mishra (2013) noted that any change initiative should account for:

1. How people work: highlighting significant features of employees' work in terms of content, sequence, timing and outcome. Any non-adherence to issues of quality should ideally be observable and actionable;
2. How people connect: highlighting the sequence of activities in service development and delivery, as well as the flow of information;
3. How process operates: highlighting the actual execution of tasks in service development and delivery.

Drawing from a review of number of publications about the use of Lean in higher education, Sinha and Mishra (2013) noted that success in the improvement of many

business processes is possible. By detailing a specific example relating to course review processes, they demonstrated how improvement to such a process would be reimagined based on how people work, how people connect and how overall processes operate. They also noted which categories of waste would have to be addressed based on the Toyota system. The authors concluded that Lean implementations in higher education have a great potential for success as long as they are accounted for in the longer-term plans of an organization. Smaller Lean projects with easily demonstrable gains should be used as a precedent for wider initiatives. Culturally, an environment of engagement is necessary for success along with a sense of shared responsibility and project ownership. Constant comparisons should be employed and communicated in order to gauge progress and make continuous improvement part of every staff member's responsibilities.

Lean in Higher Education: The Departmental Level

Doman (2011) produced a case study regarding the implementation of a Lean exercise led by students as part of their undergraduate business curriculum. At Doman's institution, the grade entry system was identified as a problem area through an audit conducted by the associate provost's office. With approval of that office, business students took on the project as a Lean "workout", a process combining elements of Toyota's Lean toolset. The Lean philosophy and tools were taught to students at the beginning of the course. The author detailed the project path that was undertaken in his course as well as the pedagogical strategies used to ensure students were ready for the improvement project. He presented some of this graphically using flowcharting.

Doman (2011) reported that students determined that that grade entering process was an "orphan" process for which no staff member claimed ownership. Through the use

of the Lean tools, students were able to put in place a more efficient and well-documented process. The author claimed that while learning was deep for students, more student work was required than originally thought to improve processes. The project was completed in eight weeks, and later taken over by a group of administrators at the university concerned with grade issues and other electronic processes.

Finn & Geraci (2012) produced a research brief relating to the implementation of Lean in the financial affairs departments of four universities. They sourced information about why institutions had chosen a Lean approach both from the literature and members of an executive roundtable (The Education Advisory Board) concerned with the oversight of financial affairs at universities. They observed that executive-level leaders typically introduced Lean initiatives and external consultants are often hired to oversee Lean projects. Lean projects typically aimed to reduce the amount of time and resources required for processes, to standardize processes across departments, and/or improve the process quality. In all four cases, oversight of Lean projects occurred through a central office concerned with quality initiatives staffed by faculty or staff members.

Finn & Geraci (2012) also noted that Lean projects followed the steps of assembling a five to eight member project team (including staff members directly affected by the process in question), mapped the current state of the process while identifying problem areas, mapped the future state and created an implementation plan to enact changes and later assess progress. They concluded that Lean process revision projects enabled institutions to save time and resources required to support processes, improved the quality and accuracy of process services, and improved employee relations

and satisfaction. They noted that Lean projects could take between two to eight months to complete, based on the overall complexity of projects.

Moore, Nash & Henderson (2007) published a monograph about a Lean implementation at the University of Central Oklahoma. Lean was introduced to the institution by the vice-president of administration due to cumulative budget constraints. The university determined through focus groups that employees believed they were held back by their own processes, costing losses of both time and morale. An employee-wide system of training was set up to move the organization toward a Lean culture and projects were devised in areas of highest priority to the university. A four-step approach was envisioned for implementing what the authors referred to as *Lean University*: identifying the opportunities (an organization-wide diagnostic search for issues, problems and opportunities), solution design (creating a blueprint for success involving all employees), implementation (using Kaizen events, core teams and metrics to implement and illustrate change) and continuous improvement (monitoring performance after projects are completed) (Moore, Nash & Henderson, 2007).

Moore, Nash & Henderson (2007) reported that the university set up four pilot projects to start the process of obtaining results via their Lean university approach: facilities management (work order system), employment services (online hiring system), purchasing (online requisition process) and their budget office (electronic monthly reports). Five-day Kaizen events were held to launch pilots and consolidate required training for employees and employed commonly used Lean techniques, such as value stream mapping. Results were tracked for projects based on resources used prior and

following the Kaizen exercises; typical results were 80-90% improvements with respect to better time and material usage.

As the result of these projects and wider Lean efforts, the university noted improvements in employee training, cost savings, enhanced efficiency, personnel morale improvements (from enhanced quality of daily work and participation in the improvement process) and reports of student and faculty satisfaction. The authors noted that when Lean was introduced it was unclear to some staff how it related to other, existing, continuous process improvement efforts (producing some confusion and making some wonder if it was in conflict with other initiatives). Also, some staff were confused about whether they were expected to take their training in Lean and apply it to other areas to be improved or await authority from their division leaders on next steps.

Paris (2007) published a study on behalf of the National Consortium for Continuous Improvement (NCCI) that reviewed how 30 institutions in the United States and Canada implemented continuous improvement initiatives, including Lean, and how these institutions handled the governance of these initiatives. The study found a great amount of variance among responding institutions with respect to how practices and structures were conceived and implemented. Formal departments to handle continuous process change initiatives were found in 65% of responding institutions while the names assigned to such departments were highly varied. Of these departments, 75% provided strategic planning services while 66% claimed they provided additional services related to institutional self-assessment. One-half of respondents noted that project management or continuous improvement methodology training was available through their department while few reported offering leadership training. In terms of governance, 60% of

responding institutions used a coordinating or advisory committee to guide operations and 57% linked their initiatives to that of the campus-wide strategic plan. One-half of respondents claimed they used a website to present information about themselves or update the institution more widely about improvement projects.

According to Paris (2007), institutions were also asked to comment on what factors they believed were most significant in ensuring success in continuous improvement initiatives. The most common responses related to a high level of involvement from senior campus leadership, defined as those holding the title vice-president or higher. Other areas noted as important were linkages to the strategic plan or vision, the use of cross-functional and inclusive approaches, aligning with the values and culture of higher education and alignment with accreditation initiatives. Respondents were also asked to describe the top two obstacles that inhibit change and continuous improvement. One-third of respondents cited negative faculty and staff attitudes toward continuous improvement and a lack of resources as being the most common inhibitors to change. Other factors inhibiting change were cited as institutional inertia, the size and complexity of their institution, decentralization and a tendency for faculty and staff to protect their "turf".

Radnor and Bucci (2011) produced a research report about Lean in UK business schools for the Association of Business Colleges (ABC), a business school advocacy group (Association of Business Schools, n.d.). The report focused on case studies (Cardiff University, Nottingham Business School, Portsmouth Business School, The University of St Andrews and Warwick Business School) as well as a synthesis of what the use of Lean in higher education looks like, where it comes from and what the

resulting experiences have been for these schools, including a look ahead to the future of such initiatives. The authors designed a study employing questionnaires distributed to university officers concerned with Lean initiatives and, later, the presentation of case studies based on their responses. Case study data was obtained via semi-structured telephone interviews. Data analysis involved the development of themes from interview transcripts and the presentation of key messages as appropriate throughout the report.

Radnor and Bucci (2011) noted clear three common outcomes from Lean initiatives as, "creating an understanding of the need to change, revising processes and practices which had been untouched for years and engaging staff to enable them to challenge and question their working practices" (Radnor & Bucci, 2011, p. 9). The authors observed that Lean was in a nascent stage in higher education and we should continue to learn from experiences of other public service organizations. Lean implementations are fragmented; making it difficult to assess all results, but early adopters saw significant results in terms of process improvement and employee engagement. Additionally, organizations reported that Lean was occasionally misunderstood, curtailing ways in which it could be implemented. The main personnel involved with Lean were administrative and support staff, as they were more likely to observe and experience the results. These personnel noted that daily distractions from ongoing job responsibilities were a barrier to implementing Lean.

Radnor and Bucci (2011) noted that organizations emphasized Lean as a directed effort toward improvement on certain projects rather than putting an emphasis on creating a culture supporting Lean. Suggested means of making this possible would require further involvement from senior management to link the Lean activities to corporate

strategy and a further understanding of customers and internal processes, and this in turn would aid efforts on sustaining Lean over the long term. Employees would see Lean adding value to internal processes and therefore benefiting themselves and other employees. Organizations reported that more work would be required to link the perceived value of these improvements to "customers", and students in particular. Some organizations envisioned moving from pilot projects to projects more integrated within the university to gain more significant results and spread a culture of Lean.

Roberts and Tennant (2003) further studied the Warwick Business School's Lean implementation by examining its "Hoshin Kanri" process. Hoshin Kanri is a Lean tool that aids in an organization's planning operations, described as the means by which projects and TQM are deployed. Beyond the planning function, it is also used to implement an organization's strategy based on clearly identified objectives. Hoshin Kanri plans are multifaceted and complex in order to reflect an organization's overall strategy, employing simple techniques, such as that of "catchball", to help team members contribute to planning and connect high-level strategy to daily job requirements. The authors concluded that, based on the experiences of the quality and reliability team at Warwick, Hoshin Kanri was effective in creating a new vision, determining new goals, reviewing processes and agreeing on milestones for the 2001-2005 time period. Milestones were later checked on a monthly basis to assess progress.

Lean in Higher Education: The Individual or Course Level

Emiliani (1998) proposed a theoretical application of Lean methodology to workplace employee behaviour. He averred that, despite the complexity involved in behaviour modification, potential gains would be similar to those gained from

manufacturing processes, principally due to the harm that incautious behaviour and speech cause in the workplace. He argued:

> A person exhibiting Lean behaviors is most easily recognizable by their ability to resist the temptation to contribute wasteful verbal or gestural content to conversations. In contrast, behaviors that inhibit workflow are analogous to wasteful batch and queue mass production methods. These behaviors are termed "fat" behaviors, and are defined as behaviors that add no value and can be eliminated. They include the display of irrational and confusing information that results in delays or work stoppages, or the articulation of unsubstantiable subjective thoughts and opinions (Emiliani, 1998. p.620).

Emiliani (1998) compared wasteful workplace behaviour directly with batch-and-queue manufacturing methodologies and suggests that it also harms the learning organization: “information becomes closely guarded, the transfer of knowledge is biased towards agreement or good news, and learning is stunted so that an organization is not able to accurately assess its competitive position” (Emiliani, 1998, p.624).

Emiliani (2008) argued that Lean methodology could be applied to considerations of the executive function and respective behaviours. The author noted that executives should consider, if not Lean methodology, at least a standardization of major leadership tasks and responsibilities. He referred to Toyota’s approach and The Caux Roundtable as examples of standardized leadership that have been successful. He also detailed examples in U.S. corporate leadership where he claimed a lack of standardization has produced calamitous results.

Emiliani (2004; 2005) published articles describing how Lean principles can be used improve graduate courses in business at his institution. The author underscored the complexity of Lean, and therefore the propensity for organizations to use the methodology only in part or incorrectly. He claimed that Kaizen, a Lean toolset, can play a particularly useful role in improvement initiatives in his view where faculty are a collegial group, not bounded by functional departments in the school, have industry experience (not ideologically opposed to industry practices), see proposals coming from colleagues (not administrators), believe in the need for improvement and are willing to try new things (Emiliani, 2005). Emiliani noted that for Kaizen to function effectively, senior management must establish a "no-blame environment" committed to not reducing headcount. Without this commitment, people are often unwilling to participate or participate half-heartedly (Zimmerman, 1991; Emiliani et al., 2003).

Emiliani (2005) argued that most curriculum development for existing graduate courses were either developed by mass-production techniques or have, over time, ended up in their current state through years of arbitrary updates. The Lean approach he advocated concentrated on the business ethic promoted by his school, followed by firm metrics around how the syllabus, required reading, assignments and examinations were developed and improved. He described the need to incorporate student feedback systematically, as well as supplying "takeaway" material for students to use to enhance their recall of course concepts. All course elements were developed with a need to recognize the student as "customer" (despite the unease this term can cause with some members of administration and the public).

When stating results, Emiliani (2005) provided a chart of course evaluation data

for a graduate level course before and after it had been improved via Lean principles. He also provided a list of written student feedback, with each comment aligned with the Lean principle at play that effected the course improvement. He stated that a potentially bright future exists in improving graduate business education by further applying Lean tools for improvement and considering the same approach to improve policy development regarding program structure and student management.

Lean Methodology in Higher Education: Summary of Literature

The following table is presented in order to summarize publications about implementations of Lean methodology in higher education. The table is presented with all publications from the previous sections about Lean in higher education, sorted alphabetically but not sorted by chapter sections:

Table 2.2

Summary of Literature about Lean Methodology in Higher Education

Author(s)	Year	Format	Nature of Publication
Antony	2014	Research article	Suggested readiness factors for higher education institutions considering the use of Lean or Six Sigma for improvement.
Antony, Krishan, Cullen & Kumar	2012	Research article	Studied UK universities; claimed Lean and Six Sigma should be used together for effective results.
Balzer	2010	Book	Case studies and theory for university settings. Emphasis on cultural sensitivity with need to differentiate between local and institution-wide Lean initiatives.
Clayton	1995	Research article	Described UK university moving from TQM to Kaizen methods. Analysis of how quality initiatives should be governed and focused on future results.

Comm & Mathaisel	2000	Research article	Adapted a framework from aerospace industry to assess Lean implementations in higher education.
Comm & Mathaisel	2003	Research article	Proposed continuous improvement for sustainability of higher education via Lean framework based on nine principles.
Comm & Mathaisel	2005a	Research article	Studied administrator perceptions about process improvement at New England universities, compared with framework in previous article.
Comm & Mathaisel	2005b	Research article	Exploratory study of New England university administrators' views on process improvement.
Doman	2011	Research article	Described undergraduate business students using Lean to improve a grade entry process at their own institution.
Hines & Lethbridge	2008	Research article	Literature survey and proposed metaphor for Lean implementations in higher education emphasizing the link between Lean projects and institutional strategy.
Emiliani	1998	Research article	Argued wasteful human behaviour in the workplace should be viewed at the same hazard level as inefficient processes.
Emiliani	2004	Research article	Described use of Lean methodology to improve a university course.
Emiliani	2005	Research article	Described use of Kaizen to improve a university business course.
Emiliani	2008	Research article	Argued that wasteful executive behaviour needs to be curbed; organizations should consider standardizing executive work.
Finn & Geraci	2012	Research-based report	Reported on use of Lean in the financial departments of four North American universities.

Flummerfelt & Banachowski	2011	Research article	Qualitative study of higher education administrators to identify areas of highest concern when undertaking institutional improvement initiatives.
Langer	2011	Master's thesis	Case studies of three large UK universities that have implemented Lean.
Moore, Nash & Henderson	2007	Monograph	Case study at University of Central Oklahoma. Described "Lean University": a four-step process in projects relating to four functional areas of the university.
Paris	2007	Research-based report	Studied how 30 different institutions set up quality improvement departments and governed Lean projects.
Radnor & Bucci	2011	Research-based report	Case study of four UK university business schools implementing Lean.
Roberts & Tennant	2003	Research article	Described application of Lean planning tool, (Hoshin Kanri) at Warwick University Business School.
Sinha & Mishra	2013	Research article	Described higher education challenges in India with recommendations on how to implement Lean based on how people work, connect and operate.

Conceptual Framework

Ravitch and Riggan (2012) defined conceptual frameworks broadly as, "an argument about why the topic one wishes to study matters, and why the means proposed to study it are appropriate and rigourous" (p. xiii). Illustrating the varied approaches to the use of conceptual frameworks in the research process, these authors posited that some researchers tend to use a conceptual framework simply as a visual means of representing a study's theoretical tenets. They claimed that some researchers would view conceptual

and theoretical frameworks as being equivalent; that is, without defining what constitutes a theory, it would be unclear what distinguishes theory from any other concepts employed in a study.

Ravitch and Riggan (2012) claimed that some researchers might successfully employ conceptual frameworks to link all of the elements of the research process. Conceptual frameworks can serve as a learning tool (Miles & Huberman, 1994), allowing researchers to establish deeper understandings of the phenomenon under investigation and enhance research results.

The Conceptual Framework Used in This Study

In this study, I have conceived and presented my conceptual framework with a number of goals in mind. Conceptual frameworks can help define the overall significance of the study (Marshall & Rossman, 2006) and I found this to hold true in my investigations. Through the development of the literature review and supporting chapters for my research proposal, this conceptual framework helped define my methodology and the underlying assumptions relating to the study (Maxwell, 2005).

The conceptual framework employed by this study is presented as follows, alongside the study's research questions and Senge's discipline levels:

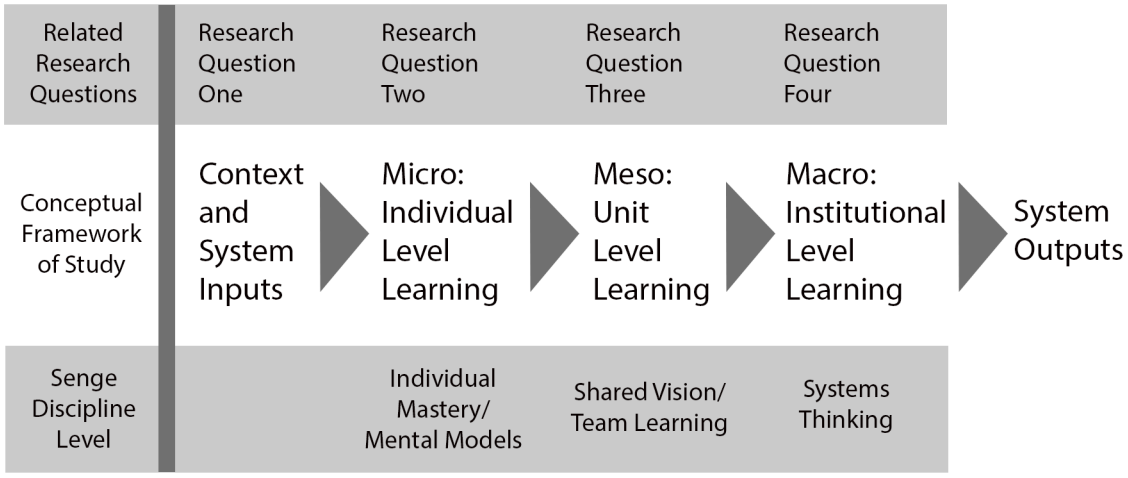

Figure 2.1. Conceptual framework with research questions and Senge disciplines.

This framework provides an original means by which organizational learning can be conceived and measured. As illustrated in Figure 2.1, this framework consists of four broad themes related to organizational learning, namely its context and system inputs, the individual (micro), unit (meso) and institutional (macro) levels of learning. The context of learning refers to the "why" regarding initiatives while system inputs serve as a means of assessing the overall efficiency of the approach. The various levels of learning that follow parallel the propositions of Senge (1990) and Yang, Watkins and Marsick (2004) and the constructs used by participants in each level are noted at the side of each level.

The diagram implies a cyclical relationship; that is, organizational learning comes full circle as the institution and its stakeholders seek new efficiencies. The concepts of flow and renewal are expressed as an integral part of organizational learning, assuming that individual learning efforts are predecessors to structural ones and detailing what is required and expected along an organization's learning path. In Chapter Five, I offer a comparison of the framework with the study's findings, as well as a reconceptualization of this same framework given the implications of these findings.

CHAPTER THREE: METHODOLOGY

Introduction

This case study describes aspects of an efficiency initiative through the lens of organizational learning at a Western Canadian university. Projects in this initiative employed Lean, a continuous improvement methodology adapted from the automotive industry, to enhance the operations of university administrative functions. Institutions of higher education are increasingly focusing on continuous improvement, through methodologies such as Lean, to better employ resources and increase the quality of services to clients (Balzer, 2010; Hines & Lethbridge, 2008; Finn & Geraci, 2012; Radnor & Bucci, 2011). Publications about the use of Lean in universities, colleges, healthcare and the public service sector typically focus on the efficacy of that particular approach to continuous improvement rather than detailing the structures that support individual and group learning or associated cultural effects.

There is a lack of agreement in the literature about what defines or constitutes a learning organization (Barker Scott, 2011; Garvin, 1993). However, it is generally agreed that organizational learning confers advantages in terms of organizational effectiveness and efficiency (Bolman & Deal, 2008; Garratt, 1987). A number of metaphors and models have been proposed for organizational learning, represented in the literature through comparisons with the phenomenon of human learning, resultant tensions between individual and group learning in organizations, common management approaches to developing organizational learning and the systems view of organizational learning (Senge, 1990; Yang, Watkins and Marsick, 2004).

The literature about organizational learning typically consists of theory-based, rather than research-informed, publications (Dodgson, 1993). Additionally, the theoretical implications of systems-based approaches to organizational learning have not been empirically explored in depth (Bui & Baruch, 2010). This case study contributes to that further exploration, using an evidence-based, qualitative methodology to inform a case study, as described in this chapter. It is said that Einstein noted that it is our theories that determine what we tend to measure; for this inquiry, the body of literature about organizational learning represents the theory while the presentation of a data-informed case study represents the means of measurement.

The case study employed a conceptual framework that conceived organizational learning from the systems view (Senge, 1990; Yang, Watkins and Marsick, 2004) while also accounting for concepts of efficiency and institutional and personal reports from the literature regarding the use of Lean in higher education. This study regards organizational learning as a systems phenomenon due to the prevalence of that model in the literature and its alignment with representations of efficiency initiatives and their methodologies.

Based upon the perceptions of unit/departmental leaders, the study's research questions were:

1. How did participants perceive the context and implementation of an efficiency (Lean) initiative at one university site?
2. What were the implications of these efficiency initiatives for organizational learning at the individual (micro) level?
3. What were the implications of these efficiency initiatives for organizational learning at the departmental or unit (meso) level?

4. What were the implications of these efficiency initiatives for organizational learning at the institutional (macro) level?

This chapter is presented as follows: an overview and background of the research site, an explication of the research design, a description of the case study methodology, explication of the research procedures (including procedures relating to data analysis) and a brief discussion of the validity, dependability and research ethics regarding this study.

Background: University Research Site

In this study, identifiable aspects of the research site were referred to only in general terms. This approach was used to provide anonymity to study participants. This anonymity enhanced the study's validity, as participants were able to report their experiences without considering professional gain or loss based upon their responses, either individually or in aggregate form. Where necessary, organizational details were reported as a range of possibilities rather than absolute figures to preserve anonymity. Further, pseudonyms were used to identify participants and any literal expressions they contributed to this dissertation.

The Western Canadian university research site in this study annually enrolled between 15,000 and 25,000 students in undergraduate and graduate programs. The university offered a broad array of degree and professional programs and was a member of the Canadian U15 group of universities, whose membership contained research-intensive universities with medical-doctoral designations (U15 Website, 2014). Over the years described in this study, the university adjusted its workforce complement, introduced committees to evaluate and make recommendations about efficiency, assessed the value of its academic programs and services and engaged in institution-wide

multiyear academic planning. Among these change initiatives and structures, a number of pilot projects involving Lean methodology were launched, intended to enhance departmental efficiencies relating to institutional procurement practices, the management of inventory and stockrooms and improvement of academic procedures regarding admissions, student affairs and additional administrative functions. University planning documents and press releases did not include any mention of the use of Lean as a means of improvement during the years mentioned in this study.

Background and Overview: Research Site Efficiency Initiatives

Lean methodology at the university was introduced in September 2011, when a project was proposed to enhance the efficiency of consumer services (e.g., services offered through the university's bookstore and food services areas). Ineffective processes and cost overruns were reported due to a number of factors including a lack of policies regarding vendor selection, an inability to match contracts with vendor products/services and incomplete vendor information. A consulting firm with expertise in improvement methodologies was retained to recommend new practices to address these concerns.

In parallel with efforts in consumer services, the university's financial services department envisioned and planned the implementation of an electronic system to further address procurement concerns. The additional concerns included a need to better manage contracts, purchase orders and the university's physical inventory in such areas as the bookstore and storerooms containing supplies for research. Given the common needs of certain university departments relating to efficiency gains, the use of Lean methodology in a pilot form across a number of departments was proposed.

In June 2012, requirements were detailed for external consultants that would provide employee training in Lean methodology and Lean tools, such as value stream mapping (VSM). A request for proposals (RFP) document was issued and a vendor was chosen later that year. A steering committee for the pilot initiative was formed and a project charter was created to guide the effort. An advisory group was formed in order to provide feedback from the Lean pilot activity back to the steering group. The advisory group consisted of university staff members who were involved in procurement from a variety of university departments. No faculty members, students or members of senior university administration served on the advisory group or the steering committee: all members were university employees.

The goals of the pilot initiative were articulated as follows:

- Assess opinions about the use of Lean methodology at the university;
- Document current procurement processes;
- Establish improvement metrics;
- Document requirements for procurement and inventory software;
- Document emerging best practices for procurement during the pilot;
- Improve processes based on established metrics;
- Train university staff in the use of Lean.

As a product of the planning phase for the pilot initiative, it was discovered that no less than six types of procurement systems were being used at the university (in addition to a common procurement card system). It was also discovered that each of the university departments used different processes and procedures to control inventory and manage purchases and receipts.

A value stream mapping (VSM) session was used to establish 61 areas of improvement that could be undertaken via the introduction of Lean projects. Value stream mapping is a Lean tool that allows teams to visualize the current and desired end states for any multistep process (George, 2002). 22 of these prospective improvement projects were categorized as short-term (i.e., "quick win" projects), requiring fewer than 30 days to accomplish. The remaining projects were categorized as medium-term (thought to take less than one year to accomplish) or longer-term projects that were believed to require one year or more to complete.

As part of the consulting firm's services, a customized certification program in Lean methodology was developed for university staff. Referred to as "green belt" training, this program required 5 days of classroom training, the completion of an examination with a passing grade of 70% and the production of documentation relating to a successfully completed improvement project. The intent of the certification designation was to enable certificate holders to later lead improvement projects on their own using Lean methods and tools. 31 university staff members participated in this certification program. Communities of practice were not established *per se* during the Lean pilot projects, however employees routinely connected with each other to share experiences about Lean projects they were involved in.

Background: Lean Project Types

Ten of the 61 projects were designated as projects that would be led by someone who was pursuing (or had completed) the "green belt" Lean certification level. A second set of projects (22 in number) was defined as projects involving procurement, but did not require the participation of someone with green belt training. A third set of projects (29 in

number) was defined as outside the scope of the pilot, as they did not relate to procurement. A project manager was assigned to oversee the overall Lean pilot and also served as a common resource for all initiatives across these three project categories.

The general methodology followed during improvement programs during the Lean pilots aligned with common industry practice and the literature about Lean. The general steps followed during the Lean improvement projects were:

- Define the issue/problem and describe the current state;
- Analyze and identify root causes/issues;
- Define the desired future state;
- Identify solutions;
- Develop and implement action plans for problem resolution;
- Define results, verification methods and expected benefits and carry out appropriate measurements.

Upon completion of the pilot projects, participants reported that the use of Lean resulted in departmental improvements. The themes of improvement related to:

- Cost savings;
- A reduction in the number of steps required to accomplish objectives;
- Improved services to students, faculty, staff and entities internal and external to the university.

Most Lean pilot projects were completed by September 2013. The university did not publish information regarding its improvement initiatives either externally or internally, and did not include terminology related to Lean or these improvement initiatives in its planning documents. No centralized administrative structure overseeing

Lean had been established at this university during the years described in this case study or at the time of this writing.

The Research Design

Creswell and Plano Clark (2011) claimed research methodology is based upon "philosophical assumptions that guide the direction of the collection and analysis" (Creswell & Plano Clark, 2011, p.5), while research methods focus on accomplishing the steps leading to successful project completion, following an appropriate research process over a "single study or set of studies" (Creswell & Plano Clark, 2011, p.5). This section categorically details the research design used in this study and the underlying research paradigm and philosophy that was followed during the study.

Crotty (1998) defined the four levels of developing a research study as: providing a paradigm overview, establishing the theoretical lens, describing the methodological approach and detailing the methods of data collection. A *research paradigm* can be defined as a worldview representing a combination of the ontological, epistemological and methodological views of the researcher (Guba & Lincoln, 2005). Ontology addresses questions about views or limits of reality held by researchers, while epistemology considers the limits of knowledge, expressible as the relationship of the researcher to the research subject(s) under consideration (Creswell & Plano Clark, 2011).

I believed that a constructivist viewpoint most appropriately represented my philosophical stance toward the study and the nature of the knowledge it might produce. From my review of literature about organizational learning, it was my observation that definitions and conceptualizations about the phenomenon would likely vary widely among participants. Given the lack of agreement in the literature on how organizational

learning should be conceptualized (or operationalized), I found it appropriate to pursue a constructivist approach to emphasize understanding, the multiple meanings held by participants and a need for the social and historical construction of meaning (Creswell, 2009).

As described by Crotty (1998), the *theoretical lens* provides the image of the organization; in this study, the lens used to examine organizational learning was an efficiency initiative. Specifically, I examined organizational images resulting from experiential descriptions of employees who participated in pilot projects following Lean methodology, some of whom had staff supervisory responsibility and some of whom did not. This resulting worldview was compared with the study's conceptual framework. A conceptual framework represents a study's theoretical home; it serves as the basis for research, the methodology of the research and can be evidenced through the very aims the research project itself (Ravitch & Riggan, 2012).

Crotty (1998) claimed that defining a study's *methodological approach* is key to describing the study itself; and the methodology that I used for this study was a qualitative methodology employing a case study method. Based on the development of themes expressed by study participants, and a comparison of these themes with the study's conceptual framework (and, by association, the literature), I believe it was the most appropriate approach to present a contextualized, highly valid, narrative of the phenomenon of organizational learning as directly experienced and reported by study participants. Merriam (2009) explained this connection, noting, "choosing a study design requires understanding the philosophical foundations underlying the type of research, taking stock of whether there is a good match between the type of research and your

personality, attributes and skills" (p.1). In terms of my personal and professional background, it was my sense that my personal beliefs aligned with the concept of subjective realities constructed and held by study participants. Additionally, I have both administrative and work experience and skills in the higher education sector, which I felt might help me understand the contexts of the challenges and opportunities faced by some study participants. The theoretical underpinnings about the use of case study as a research method, including how the study's data informed the presentation and description of the study's findings, are presented in a subsequent section in this chapter.

The *methods of data collection* represent Crotty's (1998) fourth step in developing a research study. In this study, these data collection methods promoted the constructivist approach, due to a conversational nature of personal interviews that allowed participants to incrementally describe their experiences. Semi-structured interview guides, encouraging an open discussion about participants' experiences, guided interviews. This approach to data collection ensured that major themes underlying personal, unit or organizational learning, as articulated in the study's research questions, had a reasonable probability of being captured. This semi-structured approach permitted the discovery of themes introduced by participants that were not anticipated, allowing unexpected and unique insights about organizational learning to emerge.

By employing two phases of interviewing, the natural human function of reflecting on experience over time emerged between the discussions. The use of two phases also allowed me to develop a customized, second, semi-structured interview guide based on the themes expressed by study participants and found in the analysis of data from the first interview phase. Further details about the mechanics of data collection and

theme development are presented later in this chapter. The semi-structured interview guides are provided within an appendix to this dissertation.

Qualitative Methods

Given that a number of assumptions and approaches regarding qualitative methods were used to develop the study's design, it is useful now to speak to the overall qualitative approach in this section. Strauss and Corbin (1998) described qualitative research as, "any type of research that produces findings not arrived at by statistical procedures or other means of quantification" (pp. 10-11). Highlighting the appropriateness of the approach when studying and reporting the experiences of university employees and how they learn individually and in groups during efficiency projects, qualitative methods have been described as a means of "understanding people from their own frames of reference and experiencing reality as they experience it" (Taylor & Bogdan, 1998, p. 7). With respect to studying the nature of a workplace environment, Locke, Spirduso and Silverman (2000) noted that the qualitative approach is designed "for answering questions about people in a particular social context; it is a means for describing and attempting to understand what people do" (p. 96).

Merriam (2009) provided a series of defining characteristics of the qualitative research approach as follows:

- The main concern of the research is "understanding the phenomenon of interest from the participants' perspectives, not the researcher's" (Merriam, 2009, p.6), otherwise described as the *emic* view (insider's view) versus the *etic* view (outsider's view);

- All forms of qualitative research employ the "researcher as the primary instrument for data collection and analysis" (Merriam, 2009, p.7);
- Qualitative research "usually employs fieldwork" (Merriam, 2009, p.7);
- This research "primarily employs an inductive research strategy" (Merriam, 2009, p.7), which is not to say that it employs grounded theory; however, in this case, the research project has been undertaken due to a lack of clear theory about a phenomenon;
- Since qualitative research focuses on "process, meaning and understanding, the product of qualitative research is richly descriptive" (Merriam, 2009, p.8).

Alongside Merriam's (2009) definition of qualitative research, Rew, Bechtel and Sapp (1993) noted that qualitative researchers must have appropriateness, authenticity, credibility, intuitiveness, receptivity, reciprocity and sensitivity to successfully conduct inquiry. Since I had previously designed and conducted studies of this type (i.e., a multiple case study at university and college sites), I felt procedurally and philosophically comfortable with it in terms of achieving the research goals of this study given the attention to specific priorities as noted in this section and what appeared to be a good alignment with the study's conceptual framework.

Case Study

There are a number of research considerations regarding the case study methodology. I have presented some useful directions regarding such studies from research methodology literature in this section. These are presented first from a general perspective and later describe the specific approaches followed during this study. An explanation is offered in this section regarding the *descriptive* (Yin, 2003) and

instrumental (Stake, 2005) nature of this case study. Merriam's (2009) definitions, approach and advice about case studies are featured prominently in this section, as I found them to be highly influential throughout the design and course of this study.

Looking at the study's method from a general perspective, Hitchcock and Hughes (1995) described a case study's defining features as:

- A concern about rich, vivid descriptions of events relevant to the case;
- A chronological narrative of events relevant to the case;
- A description of events blended with an analysis;
- A focus on individual actors or groups of actors;
- A highlighting of specific events relevant to the case;
- Integral involvement of the researcher in the case;
- Portrayal of the richness of the case in writing up the report. (p. 317)

Nisbet and Watt (1984) defined the case study as a "specific instance that is frequently designed to illustrate a more general principle" (p. 72). Building upon this notion, it has been claimed that case studies can "establish cause and effect" (Cohen, Manion & Morrison, 2003, p. 181) by observing "effects in real contexts" (Cohen, Manion & Morrison, 2003, p.181). Berg (2004) similarly defined the goals of the case study as "systematically gathering enough information about a particular person, social setting, event or group to permit the researcher to effectively understand how the subject operates or functions" (p. 251).

Yin (2003) described three types of case study: exploratory (as a pilot to other studies or research questions), descriptive (providing narrative accounts) and explanatory (testing theories). While I believe that linkages could be demonstrated relating to the

exploratory and explanatory approaches to case studies, this study followed Yin's (2003) descriptive approach in order to give a clear voice to study participants while permitting the freedom required to establish themes and use research writing techniques to describe organizational effects in context.

Stake (2005) defined case studies around three different parameters: intrinsic (where no attempt is made to generalize the study beyond the single case or build new theory), instrumental (where the case is presented mainly to provide insight into an issue or revise a generalization) or collective (where a number of cases are studied in order to investigate some general phenomenon). This study followed Stake's *instrumental* approach; as the goal was not to present new, fully formed theory about the learning organization; rather, it served as one instrument to clarify a view presented through one lens of analysis. Stake (2005) also noted that case study research is an approach "stemming from multiple meanings". However, when using the case study research methodology, the literature about research methods contains clear advice that researchers should follow to avoid bias and interpretation issues. Walker (1980) detailed important issues relating to participant selection while Sturman (1997) detailed the issues relating to the collection and interpretation of data collected and interpreted by participants, observers and researchers.

Merriam (2009) noted:

> A case study design is employed to gain an in-depth understanding of the situation and meaning for those involved. The interest is in process rather than outcomes, in context rather than a specific variable, in discovery rather than

confirmation. Insights gleaned from case studies can directly influence policy, practice, and future research. (p. 19)

Merriam (2009) further noted that the case itself is the "bounded system or unit of analysis" (p. 43) permitting the result of the research to be richly described through a discrete research effort. Qualitative case studies can be *particularistic*, meaning that they "focus on a particular situation, event, program or phenomenon" (Merriam, 2009, p. 29). They may be *descriptive*, resulting in a research product that is a "rich, thick description of the phenomenon under study" (Merriam, 2009, p. 29). Such studies may also be *heuristic*, meaning, "case studies illuminate the reader's understanding of the phenomenon under study" (Merriam, 2009, p. 30).

A single site approach was undertaken to avoid the complexity that would result from a multi-site analysis of learning organizations and to enhance the particularity of this case study. In Western Canada, many universities have launched efficiency initiatives and, while some have used Lean methodology, all differed in how the methodology was used. By employing the single site approach, it was my hope to establish a rich description of organizational learning from multiple participant perspectives and tell the story in such a way as to inform the literature further about organizational learning but also provide practical, useful advice for administrators and employees at other institutions who may be considering efficiency initiatives.

Research Procedures

Glene and Peshkin (1992) advised researchers to choose data sources that will most likely extract the experiences and information sought through the study to gain understandings of the phenomenon being studied, to contribute new perspectives to the

phenomenon under consideration and to make good use of time during data collection. In this section, I present the strategies I used to achieve these goals.

Sample

Purposive sampling was used to establish the list of study participants. Given the total numbers of Lean initiatives (61 in number) and potential participants (231 in number), and the fact that the study used a qualitative approach, it was not possible or advisable to seek interactions with all possible participants. Additionally, given my methodological choice, I felt it was a stronger approach to tell the story of the phenomenon by describing the experiences of fewer projects and participants more richly, therefore establishing meanings of higher theoretical and practical value.

I established criteria for choosing four Lean initiatives/projects and consequently choose two participants from each of these projects, resulting in a potential participant pool of eight. Per an analysis of similar case studies and dissertations, I determined that eight participants and four projects would be sufficient to provide adequate theme development and ensure research continuity if participants withdrew from the study. For cases where participants withdrew, my contingency plan was to use these same selections criteria to select additional projects and participants in order to keep the study on track. In the end, seven participants were included in the study as one of the participating departments was only able to make one staff member available for interviews.

The criteria for choosing Lean projects were:

- The project was completed;
- The project represented a function found in an academic institution;
- The project was distinct from the other projects.

Per these criteria, the following four Lean pilot projects were selected for this study:

- Chemistry supply stores;
- Medical research supply stores;
- Graduate admissions in a specific faculty;
- University Bookstore.

The selections criteria for participant selection were:

- Had been involved with the project from inception to completion;
- Had completed the common Lean methodology training;
- Has been employed by the university for at least four years.

Access: Identifying the Participants

Participants were contacted using a written communication to their immediate supervisor requesting participation in this study. I sought additional verbal agreement from the immediate supervisor in person to establish a sense of comfort about the research and allow the supervisor to ask any questions they may have about the research project. I also held a meeting with the Vice-President, Administration of the university describing my study and its aims and had a conversation to help me clarify the background information as described earlier in this chapter.

The requirements of the study were clearly detailed in written format, including the means of data collection and analysis, the purpose of the study and the fact that participants could withdraw at any point. A separate invitation was sent later to bring the group of participants together to discuss some of the results of the study as some participants expressed an interest in learning more about the aims and findings of the study. These letters of participation are found in the appendices of this dissertation.

Data Collection Procedures

Data were collected through face-to-face interviews between the researcher and each participant. Interviews were approximately one hour in length; however, extra time was planned so neither the participant nor I felt rushed. The extra time also ensured that participants had a sense that they were able to give complete, reflective responses or ask any questions about the research project. I took handwritten notes to capture key statements and themes and consider any early coding activity that was possible. Interview guides were provided to participants one week prior to interviews in order to allow them to develop their thoughts and consider their involvement in the research project in a more informed way.

All sessions were recorded digitally with the permission of participants; the audio recordings were later transcribed for use in data analysis. Transcripts were provided to participants, who then reviewed them and suggested changes if required. Signoffs were obtained from participants ensuring the accuracy of the transcripts.

Pilot Interviews

Pilot interviews were conducted with two participants who were in the sample for this case study. The purpose of the pilot interviews was to assess the efficacy of (and improve, if required) the first semi-structured interview guide. The pilot interviews also provided a means of ensuring that interviews could be conducted within the proposed time limits while permitting participants to provide accurate and complete information. Data from the pilot interviews were considered valid and could serve to inform the study in the case that only slight changes would be made to the semi-structured interview guides (as turned out to be the case).

In this study, the data collected during the pilot interviews was used alongside all of the other study data as the interview guide was found to be effective and no substantial changes were made to that guide (outside of grammatical changes) as I interviewed more participants.

Phase I: Initial Semi-Structured Interviews

After slight changes were made to interview guides from the pilot interviews, phase I interviews were conducted individually with study participants per the parameters expressed in the previous sections. Questions in the interview guide were based upon the conceptual framework regarding organizational learning. The interview guide consisted of five questions representing Senge's five disciplines and two introductory questions were included about the context of the study and the participant's work setting. An example of a question representing individual mastery (Senge's (1990) first described discipline) is provided as follows:

> What was the significance of this project for you individually? What new learning (knowledge, appreciations, skills) did it involve for you or others in your unit? How challenging was this for you?

The version of the semi-structured interview guide in this dissertation's appendices is the version that was updated subsequent to the pilot interview phase.

Phase II: Elaboration Semi-Structured Interviews

The development of the phase II interview guide took place upon completion of phase I interviews and qualitative data analysis that occurred after the completion of the interviews. These data analysis procedures are presented later in this chapter. The procedures were used to develop participant themes and to compare them with the

study's conceptual framework. Based on the product of this analysis, questions were developed for the phase II guides to allow me to probe more deeply into the themes from the phase I interviews. In tandem with this redevelopment, a reconsideration of the study's conceptual framework was undertaken, including further examination of literature where appropriate. It took approximately four months to create the phase II semi-structured interview guide and conduct the subsequent set of phase II interviews.

Other Data Sources

Since the case study methodology endeavours to tell the story of those who participated in a certain phenomenon, it is important to build an understanding of that story from multiple perspectives. Therefore, I used additional sources of data to further validate results. These additional sources of data are detailed in this section.

During the Lean pilots conducted at the university research site, a survey was developed and administered to university staff involved with improvement initiatives. I reviewed the survey results to better understand which departments had undertaken improvement initiatives and what the likely demographics would be of study participants. Where appropriate, high-level documents publically published by the university regarding institutional planning were reviewed during the course of this study. These documents were useful for establishing comparison points between themes put forward by case study participants and institutional themes presented by the university in its planning documents.

Data Analysis

As detailed in the previous sections, the case study methodology involves a telling of the story or phenomenon through the rich description of experiences and the

conceptualizations held by study participants. In order to do this, the data were coded and continuously compared with other study data and the study's conceptual framework. This section describes the procedures that were used in this study to achieve this objective.

Coding

In this section, I describe a general method of coding as it applied to this study (based on Strauss and Corbin, 1990) and a more particular form of coding that I employed in this study (based on Saldana, 2013). As I will detail below, I chose to use this updated, particular approach to coding due to its more focused applicability to the nature of my study, its applicability to the use of technology-supported coding and the study's points of inquiry.

General approach to coding. Strauss and Corbin (1990) described the three steps of *open coding* to as "line-by-line analysis, analyzing whole sentences and perusing the entire document" (p. 119). I generally followed this approach while analyzing interview notes; using analysis software that permitted the efficient storage and manipulation of text and themes (NVIVO), I ensured that these three units of analysis were not only continuously compared but also preserved and sorted by emerging categories. By preserving these notes in various units of analysis, I was able to later give voice to the study participants by using their exact phrasing when presenting the results of the study (Using NVIVO codes in some cases, referring to each by pseudonym as "callout" text).

Axial coding (Strauss & Corbin, 1990) is the process whereby categories are developed from the units of analysis. Specifically, Strauss and Corbin described this as the process of "relating categories to their subcategories, termed 'axial' because coding occurs around the axis of a category, linking categories to the level of properties and

dimensions" (Strauss & Corbin, 1990, p. 123). Memos (Strauss & Corbin, 1990, p.100) were used in order to keep track of the thought processes that led to the establishment of categories and subcategories. The general forms of this method of data analysis (including memo writing) were done using the NVIVO software.

Selective coding (Strauss & Corbin, 1990) was used as a final step to relate categories to the core categories emerging from the analysis. The core categories were the categories found with the greatest frequency, connectivity and overall importance based on the analysis of the coded data. These core categories are presented and explicated in the subsequent chapter where the study's data is presented.

Particular approach to coding. Saldana (2013) referred to a code as "most often a word or a short phrase that symbolically assigns a summative, salient, essence-capturing and/or evocative attribute for a portion of language-based or visual data" (p.3). Charmaz (2001) described coding as the critical link between data collection and their explanation of meaning. In this section, I describe the particular approach I used to manage the coding process (through first and second cycle coding), how I constructed and used memos and how I conducted data analysis to create categories in order to find the major study themes and concepts.

I used the NVIVO software to assign and manage codes to the study's data: transcripts of the interviews that I conducted. While NVIVO contains features that will "autocode" the data; that is, parse all data and suggest units of analysis and possible categories, I opted to import all interview transcripts and parse them manually. By parsing the text manually, I was hopeful that I would be able to ascribe meaning to what was said by better understanding the nature of the participant's words in the context of

the question(s) they were responding to and the responses of other participants. As I coded the data, I used NVIVO to create memos where appropriate relating to the emerging codes and categories; I also used a "coding diary" memo to keep track of my progress and any decisions undertaken with respect to the overall coding process.

When legitimizing appropriate times to refer to memos or create new memos (including the use of the coding diary), I referred to the model proposed by Birks, Chapman and Francis (2008) who suggested a mnemonic based on the word "memo" itself, indicating memos are most appropriate for:

- M (Mapping research activities);
- E (Extracting meaning from the data);
- M (Maintaining momentum);
- O (Opening communication). (p. 50)

My overall approach was not meant to reduce the data to a more usable form; rather, my thinking aligned with the approach advocated by Madden (2010), who claimed that good coding typically should add to the overall research story. As I parsed the interview text, I realized that I would be assigning different codes to similar passages depending on what text or subtext related to different possible categories or emergent themes. Saldana (2013) refers to this as simultaneous coding, and this approach seemed logical given that, for this study and its interview guides, multiple meanings could be assigned to responses given that more than one concept at a time was presented or represented in some, but not all, interview questions.

Since the very nature of coding is incremental (i.e., new codes are generated through the coding process), it was required for this study that two cycles of coding

occurred for all data. For example, while coding the first participant's interview transcript, how would it be possible for the researcher to know to associate certain pieces of text/ideas with a code that has not yet been generated (and may very well be generated only as you review the penultimate or ultimate participant transcript)? Therefore, coding is not just labeling, it is linking and "it leads you from the data to the idea, and from the idea to all the data pertaining to that idea" (Richards & Morse, 2007, p. 137). Saldana (2013) referred to these two cycles of coding as first and second cycle coding.

I did not make the assumption that codes would have to be generated for the five levels of Senge's (1990) *Fifth Discipline* model of organizational learning; however, while coding it was clear that since interview guides were constructed along these lines, it would be natural that such codes may serve as one means of categorizing some of the data. Merriam (2009) corroborated this though her stated view that "our analysis and interpretation, our study's findings, will reflect the constructs, concepts, language, models and theories that structured the study in the first place" (p.48).

I opted to code the data obtained from supervisors and non-supervisors separately. As I began the process of coding data from supervisors, I noticed that there would likely exist a significant number of codes and categories emerging from that particular subset of participants. By referring to Saldana (2013), I was able to gauge an acceptable number of codes that could best inform the nature of this study. Saldana (2013) noted that novices, in general, should "code everything" (p.16) and the number of resultant codes chiefly correlates to what the researcher and/or the software used for the study can accommodate. Saldana (2013) proposed an acceptable range of "120-300 codes" (p. 24).

It was useful throughout this process to have a visual representation of what the overall coding and analysis process was aiming to accomplish. I used a modified version of a framework provided by Saldana (2013) to keep "my eyes on the prize", (as it were), presented as follows:

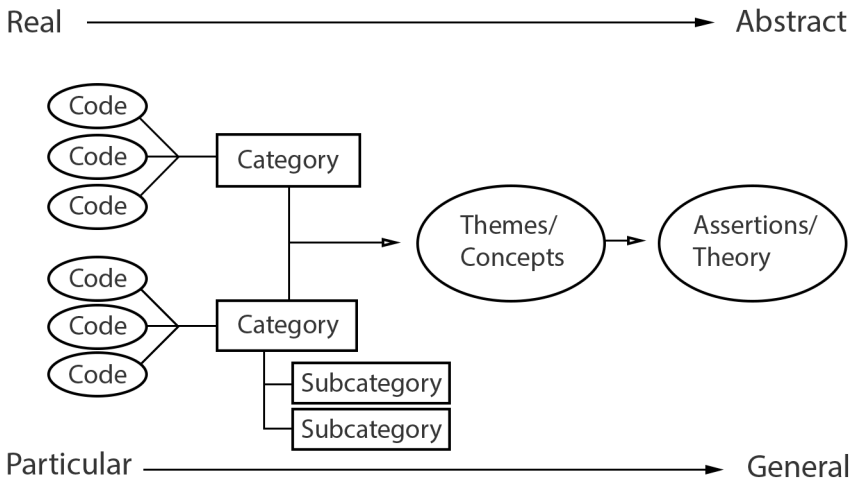

Figure 3.1. Saldana's (2013) Codes-to-Theory Framework (Simplified). Adapted from "The Coding Manual for Qualitative Researchers (2nd ed.)" by J. Saldana, 2013, Copyright 2013 by J. Saldana.

It is important to note that the adaptation that I made when using this model was that this particular study aimed to develop categories and subcategories that could lead to themes and concepts rather than the development of assertions or theory. I was comfortable with this streamlined approach given that the methodological approach to my study was not grounded theory or anything attempting to build new theory; rather, by getting at themes and concepts only, the approach would be akin to Charmaz's (2001) advice where codes constitute the bones of analysis and the integration of codes creates a skeleton.

I was also mindful during this process of advice given to me by colleagues on good procedures for qualitative methods and coding as well as the advice of Auerbach and Silverstein (2003, p. 44), who recommended keeping a copy of the research concern, theoretical framework, central research question and the goals of the study close by while coding, all of which I found to be helpful throughout the process.

Presentation of Data

The analyzed data are presented in chapter four. It is presented thematically in terms of what participants said in relation to the study's research questions. There are a number of considerations when presenting data using a case study approach. While different readers will be looking for various types of detail in this presented data, the researcher must make choices relating to this overall level of detail (Merriam, 2009). Stake (2005) claimed that descriptions must balance conciseness with an expressed level of detail that achieves the objective of accurately telling the story related to the study. In this study, I have explicated themes relating to organizational learning using both the themes developed though participant interviews and constant comparisons and directly using the words expressed by participants where appropriate. These themes were compared with the study's conceptual framework (and therefore the literature) permitting me a means to globally and individually address the study's research questions.

It is useful at this point to explain the difference between what is presented in this chapter versus what is presented in the subsequent chapter. The following diagram offers a visual interpretation of how the information is sorted by chapter:

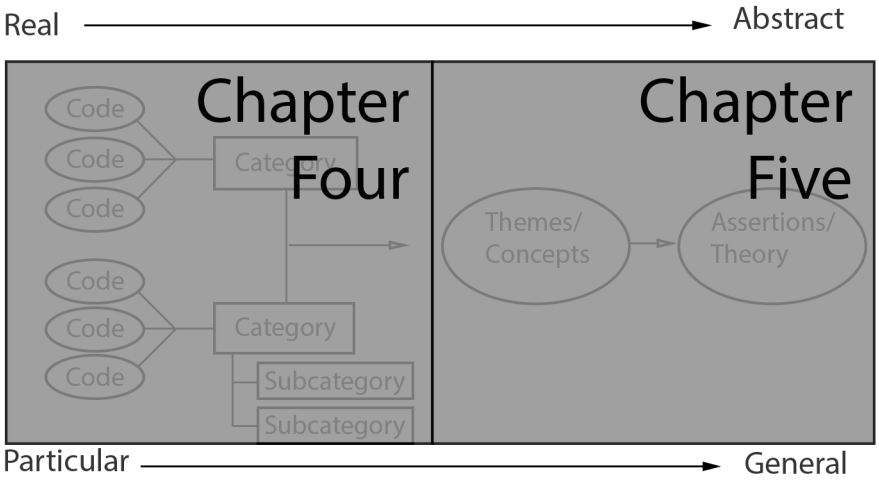

Figure 3.2. Chapter content delineated per Saldana's (2013) Codes-to-Theory framework. Adapted from "The Coding Manual for Qualitative Researchers (2nd ed.)" by J. Saldana, 2013, Copyright 2013 by J. Saldana.

As represented in figure 3.2 (left hand side), this chapter presents the study's findings, expressible in terms of Saldana's (2013) codes-to-theory framework for qualitative inquiry, through the codes and categories developed from the study's data. As seen in the same figure (right hand side), chapter five is concerned with providing the study's discussion and conclusions, expressible in this same model via references to the study's themes, concepts and assertions or implications for theory.

Trustworthiness

As Merriam (2009) observed, "being able to trust research results is especially important to professionals in applied fields, such as education, in which practitioners intervene in people's lives" (p.198). A number of factors were considered during the planning of this research project to ensure trustworthiness and the overall quality of the research; these are described in detail in this section.

Qualitative research does not aim to produce results that can necessarily be generalized to wider contexts. In reference to case studies, Stake (2005) claimed,

> The purpose of a case report is not to represent the world, but to represent the case. Criteria for conducting the kind of research that leads to valid generalization needs modification to fit the search for effective particularization. The utility of case research to practitioners and policy makers is in its extension of experience (p.460).

The subjective nature of expressing results from the point of view of a single researcher must be considered when developing case study research. There is a need to account for biases or "blind spots" that researchers may have. Data collection, analysis and interpretation can be subjective (Sturman, 1997), and a number of procedures have been described in this chapter that are intended to mitigate this limitation. In addition to these procedures, I engaged in periodic inter-rater analysis of some of the study's codes and categories with my dissertation supervisor to help ensure I was on a reasonable track.

Further to bias, Stake (2005) described triangulation as a means of ensuring trustworthiness in a case study. In this study, the use of four different Lean projects to establish themes relating to organizational learning represented a degree of triangulation regarding the study's results. The use of constant comparisons of study data with the literature and the study's conceptual framework was an additional means of enhancing the trustworthiness.

Dependability

While a case study methodology does not represent an approach whereby results could be found elsewhere, it is conceivable that further inquiry into organizational

learning viewed through the lens of efficiency would prompt further study with a continued focus in post-secondary education on finding new efficiencies and the introduction of continuous improvement programs. By presenting an appropriate level of detail about methodology and methods, assumptions, aspects of institutions, projects and participants I hope to enhance the possibility that future researchers may replicate studies of this sort or similar studies (Creswell, 2009).

Ethics and Confidentiality

This study was conducted with a view that the highest possible standards of research ethics and respect for participant confidentiality would be followed. The general ethics procedures outlined by the University of Saskatchewan Advisory Committee on Ethics in Behavioural Sciences Research were followed. These guidelines included the use of participant consent forms, notification of confidentiality procedures, and the release of transcribed data forms. Participants were informed in writing about the nature of the research and the fact that they could voluntarily withdraw from the research at any time. Participants were given the opportunity to review interview transcripts and notes in order to ensure their views were accurately and fairly represented. The sample of the letter of introduction and consent and release forms for participants are found in appendices to this dissertation.

Chapter Summary

In this chapter, I presented the study's research methodology and method. I described background information about the research site (a Western Canadian university) and the nature of Lean efficiency initiatives that had been at that site. Brief descriptions were offered regarding the four departments where improvements were

sought and background information was provided with respect to how the university planned and executed these improvement projects from 2011 through 2013.

I then described the research design in detail. The methodology used within this study was a qualitative methodology employing a case study method. Data were collected over two phases of interviews and coded and analyzed using Saldana's (2013) Codes-to-Theory framework and general principles of open, axial and selective coding (Strauss & Corbin, 1990). Issues of trustworthiness and validity were identified and discussed, as well as issues of ethics and the confidentiality of data and participants.

CHAPTER FOUR: PRESENTATION OF COLLECTED DATA

Introduction

The perceptions of university employees involved in an efficiency initiative at a Western Canadian university, as reported by employees themselves, constituted the data collected and analyzed for this study. Study participants were either senior leaders (with multi-department oversight of budget and employees: typically a director role) or unit leaders (with departmental responsibility for budgets and employees: typically a manager role). All participants had been involved with at least one efficiency initiative employing Lean methodology within their department or departments between September 2011 and September 2013. This study presents an examination of a university efficiency initiative from the perspectives of individual, group (unit) learning and organizational learning.

In this chapter, I present background information about the projects and participants in the study as well as the study's findings. These findings are presented in sections that correspond to the study's research questions. Each further section is presented based upon categories and subcategories developed through data analysis. Within each section, the participant voice is present with selected literal presentations of interview responses in the context of the study's research questions.

Projects and Participants

Lean methodology at the research site was introduced in September 2011. Most Lean projects (equivalently referred to as "improvement projects" or "efficiency projects" in this study) were completed by September 2013. The information in this section consists of Lean project descriptions and background information about participants, including their professional backgrounds and role with the university, their training and

work experience and their role within the efficiency projects. Pseudonyms were used to identify participants throughout this study.

Chemistry Supply Stores Project

The university's chemistry supply stores maintain an inventory of key items required for teaching and research for the Chemistry department and associated academic divisions requiring similar supplies (e.g., Biology). The supply stores order supplies as required or requested. Over a number of years, the stock and inventory control mechanisms of the stores had fallen into disorder and it was determined within the division that an overhaul of the operation was required.

The major steps in this project were to remove unwanted inventory, clean up the remaining inventory, reorganize that inventory using a "bin" system (to ease the tracking of inventory) and improve the associated computer systems to benefit people who work with inventory or make requests of the stores. In terms of Lean methodology, this project was characterized as a "5S" project, which typically follows the steps relating to sorting, setting in place, shining, standardizing and sustaining aspects of the workplace, including those requiring inventory maintenance (George, 2002).

The project outcomes included a reorganization of inventory, a safer workplace in the storage areas and streamlined inventory processes. Examples of these outcomes included a reduced number of unnecessary or dangerous items or gasses, a reduction in time required for staff to find items in the inventory (due to the bin system), a reduction in storage cost (as many items were deemed unnecessary to hold in inventory) and enhanced client satisfaction (due to the reduced times required to satisfy client requests).

Dave: Senior leader participant. Dave's position related to the management of university facilities, specifically the management of materials handling. At the time of the study, Dave had worked at the university for over 25 years and had worked his way up through different positions. Over the years, he had developed an understanding of improvement methodologies, including Lean, and has pursued certifications in his professional field as well as the certification in Lean offered by the university.

Jill: Unit leader participant. Jill's position was concerned with aspects of the chemistry stores from the perspectives of how they were financially resourced and operated. At the time of the study, Jill had worked at the university for over 25 years. She had worked in both office and technical roles with the university prior to this role she held during the time of the study. Jill held degrees in biology and agriculture.

Health Sciences Supply Centre Project

The health sciences supply centre supported multiple departments in the academic health sciences (e.g., medicine, nursing). The centre was developed due to changes in the building's infrastructure intended to enhance collaboration in healthcare research. As a result of this change in direction, new equipment was installed in the supply centre (such as mechanical shelving) to better manage its inventory. Additionally, the overall value of goods held and distributed by the store grew from approximately $100,000 per annum to over $1M per annum in the years leading up to the time of the study. The number of full-time and part-time employees also increased during this expansion of service.

The Lean project undertaken by the health sciences supply centre aimed to improve computer operations relating to inventory management and how clients place orders for supplies. The project outcomes included an improved, more efficient computer

system implemented alongside a system that more efficiently tracked financial codes used to index expenses related to the ordering of supplies.

Paul: Senior leader participant. At the time of the study, Paul was in a supervisory role regarding the operations of a variety of functions supporting the academic health sciences and had worked for the university for 21 years. He held positions of progressive responsibility in both administrative and academic staff roles prior to his role at time of the study. Paul held degrees in biology as well as certifications in healthcare delivery.

Kevin: Unit leader participant. Kevin was the manager overseeing the day-to-day operations of the health sciences supply centre. At the time of the study, Kevin had worked for the university for more than 4 years. Prior to working for the university, Kevin had a long career in the industrial sector (over 35 years), which included work with a variety of improvement methodologies. He had toured factory sites in Japan where Lean and related improvement methodologies were commonly used.

Graduate Admissions Project

As part of a wider reorganization of academic and administrative functions, a specific academic department undertook a series of Lean initiatives to streamline their graduate admissions processes. The project goals were met; specifically, improvements were made to a prospective student graduate inquiry application process. Additional efficiency improvements were realized through efforts to centralize administrative functions, such as payroll administration.

Susan: Senior leader participant. Susan was in a director-level role relating to the oversight of operations for the academic department, including undergraduate and

graduate program delivery and related services (such as student services and applications/transfer students). At the time of the study, she had worked for the university for over 27 years and had been in this supervisory role for over 10 years. I determined there was not a suitable unit leader participant in this department given the goals of the study; therefore, this project area involved a sole participant.

University Bookstore Storeroom Project

The university bookstore was typical of operations of its type; it stocked and sold academic and non-academic books, university-branded clothing and various supplies used by students, staff and faculty. Over a number of years, the storerooms holding the bookstore's inventory had become disorganized to a point where employees were unable to find materials. Additionally, some materials that otherwise would be sold had been thought to be missing or had ended up damaged and some storage areas did not comply with safety regulations (e.g., blocked aisles in the storerooms).

With the help of efficiency consultants retained by the university, a Lean project was proposed that used the "5S" approach previously described in the chemistry supply stores project. A sixth "S" was also operationalized in this project, recognizing "safety" as a project goal. The overall project goals were met, as staff working collaboratively were able to effect changes through the storerooms to better sort and manage inventory, keep aisles clear and promote a culture where people maintained efficiency gains by ensuring the inventory did not revert back to its original state.

Linda: Senior leader participant. During the Lean project, Linda was in an acting role as supervisor of all of the bookstore's operations. At the time of the study, Linda had worked for the university for over 20 years and had worked in a variety of

capacities relating to how the university provided retail store services to students prior to working in the acting supervisor role.

Chris: Unit leader participant. Chris conducted oversight of the bookstore's shipping and receiving functions. At the time of the Lean project, he had worked for the university for over 30 years, and had worked in an oversight or direct contribution capacity for shipping/receiving and working within warehouses throughout his career.

Summary of Projects

The following summarizes the study's improvement projects, project descriptions and departmental participants. This summary table is provided to help readers keep track of the projects and participants through the presentation of data in this chapter:

Table 4.1

Summary of Projects and Participants

Project Area	Brief Project Description	Senior Leader	Unit Leader
Chemistry Supply Stores	Cleaned up inventory and improved inventory tracking and ordering processes.	Dave	Jill
Health Science Supply Centre	Cleaned up inventory and improved inventory tracking and ordering processes.	Paul	Kevin
Graduate Admissions	Streamlined graduate admissions and other academic administrative functions.	Susan	N/A
University Bookstore	Cleaned up storerooms and implemented a system to ensure inventory remained organized.	Linda	Chris

Presentation of Findings

The study's findings are presented in this section corresponding to the study's research questions. Findings are presented according to the categories and subcategories developed during data analysis.

Research Question One

The study's first research question was, "How did participants perceive the context and implementation of an efficiency (Lean) initiative?" This research question can be viewed in the context of the study's conceptual framework as follows:

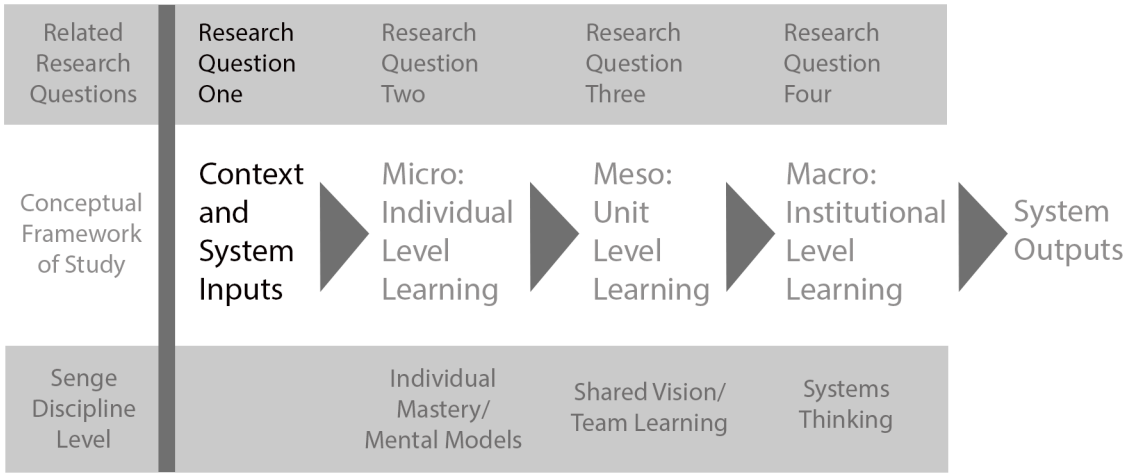

Figure 4.1. Research question one within the study's conceptual framework.

Figure 4.1 indicates that the study's first research question did not correspond with Senge's (1990) disciplines of the learning organization. Findings that related to the overall context of the improvement projects and learning as reported by participants are presented in this section in a general format to establish broad themes regarding the nature of the projects, participants and the institutional climate of the research site.

Context and system inputs: Senior leaders. Senior leaders discussed improvement projects in terms of the *business need for improved efficiency* and how they *perceived learning and efficiency in context*.

Dave described the business need for improved efficiency in terms of workplace problems (e.g., as safety concerns) and smoothing the workflow for employees. He was aware of directives intended to reduce the operating deficit of the university and worked to improve departmental financial performance. He described the need for efficiency improvements in terms of ensuring that researchers and teachers had the supplies required to accomplish their goals. He described learning in terms of group project training and how people learned about Lean itself. Regarding his personal learning, he was interested in obtaining the Lean certification offered by the university. He described group (unit) learning and organizational learning as exigent phenomena, both useful to his department and the institution as a whole.

Dave described personal efficiency as being different from workplace efficiency. He described changes he made to his workflow by using only digital documents. In the workplace, he described improvements to managing safety and inventories. He described efficiency as a result of organizational learning: however, he noted that as people enter and leave the workforce, tacit knowledge is gained or lost.

Paul talked about efficiency goals in the context of providing researchers supplies to produce successful research and teaching outcomes. This need emerged with the introduction of a collaborative academic model, encouraging interdisciplinary research among the health sciences. He described a need to develop employee competencies while ensuring financial sustainability when seeking improvement. He talked about his personal

learning in terms of his previous learning within healthcare settings. He viewed improvement methodologies as valuable, but of less value than the cultural context of the organization. He described a benefit of Lean as demonstrating direct improvement actions to stakeholders, promoting its credibility as a useful business process.

Paul described personal efficiency in terms the work of researchers. By improving services, researchers could focus on research rather than administrative procedures. He viewed efficiency as a natural goal, driven by employees who take responsibility for developing workplace solutions. He viewed Lean methodology as an enabler; however, he believed that employee disposition and efforts toward change were superordinate to any specific improvement methodology.

Susan described departmental efficiency in terms of streamlining transactions and permitting personnel to adopt new workflows. She described the cultural and learning implications of introducing improvement projects when other departmental change was underway. She described a generational shift in the workplace and how this impacted learning in terms of receptivity to change and learning styles. She felt there was a natural tendency of groups to learn collaboratively and saw Lean as providing a framework that promoted efficient group decision-making and learning.

Susan described efficiency from the perspective of how employees embrace change and establish project goals and vision within the context of an institution's culture. When departments make administrative changes, communication problems arise that impact employee morale and efficiency. For executive leadership, she believed that succession planning was crucial to maintaining organizational learning.

Linda described efficiency in terms of how it impacted university bookstore customers and employees. She described efficiency from the perspective of customer perception. Customers gained timely access to academic resources while employees gained collaborative decision-making regarding inventory management. She viewed efficiency as a means of improving workflow, improving the bookstore's financial results through increased sales and reducing excess inventory and product damage. She viewed individual and group learning as core requirements for improvement projects, which represented catalysts of change. She described efficiency as a means of sustaining operations and employee training.

These senior leaders commonly spoke about how efficiency would help meet the needs of their departments and ensure that services would be available to students and employees to make them successful in their various endeavours.

Context and system inputs: Unit leaders. Unit leaders discussed improvement projects in terms of the *business need for improved efficiency* and how they *perceived learning and efficiency in context.*

Jill described the efficiency goals of improvement in terms of workplace safety and reporting requirements. She described learning in terms of how change was viewed by individuals and by groups; employees accepted change better in cases with obvious business needs. Improvement projects promoted group learning and decision-making, as well as a democratic means of establishing consensus. Store employees found previous processes to be error-prone and clients found that unnecessary steps were required to order supplies. She believed that in addition to introducing new efficiency procedures, a culture of efficiency would have to be concomitantly developed to ensure progress.

Kevin described efficiency in terms of workplace structural and cultural changes. With the introduction of collaborative research space, the needs of an increased number of researchers were addressed with resources previously used to satisfy the needs of smaller departments. He described his personal learning during improvement projects in terms of his previous learning and experiences. Specifically, he referred to the cultural differences between industrial settings and university operations. He felt that the decision-making model used by universities would be largely ineffective in the private sector as it was overly consultative and lacking in focus on organizational priorities. The university environment followed few standard policies and practices across the ten campus supply stores.

Chris described efficiency in terms customer needs and inventory management. He observed increases in customer service expectations in the bookstore and a loss of employee productivity due to inefficient warehousing practices. He believed that departmental improvements would have been achievable without Lean. He believed that efficiency gains are obtainable from employee tacit knowledge and intuition. These employees need to develop a culture of improvement, always seeking the best approaches to tasks. Listening to employee views pays high dividends because employees themselves have direct knowledge of what must be accomplished.

Unit leaders tended to view the context of workplace efficiency in terms of requirements for safety and in terms of motivating employees to be more engaged with their work. By becoming familiar with the ideas of efficiency, they would be able to carry that philosophy through to the front lines and share learning experiences with colleagues to improve service delivery.

Research Question Two

The study's second research question was, "What are the implications of these efficiency initiatives for individual learning (micro level)?" This research question is presented in the context of the study's conceptual framework as follows:

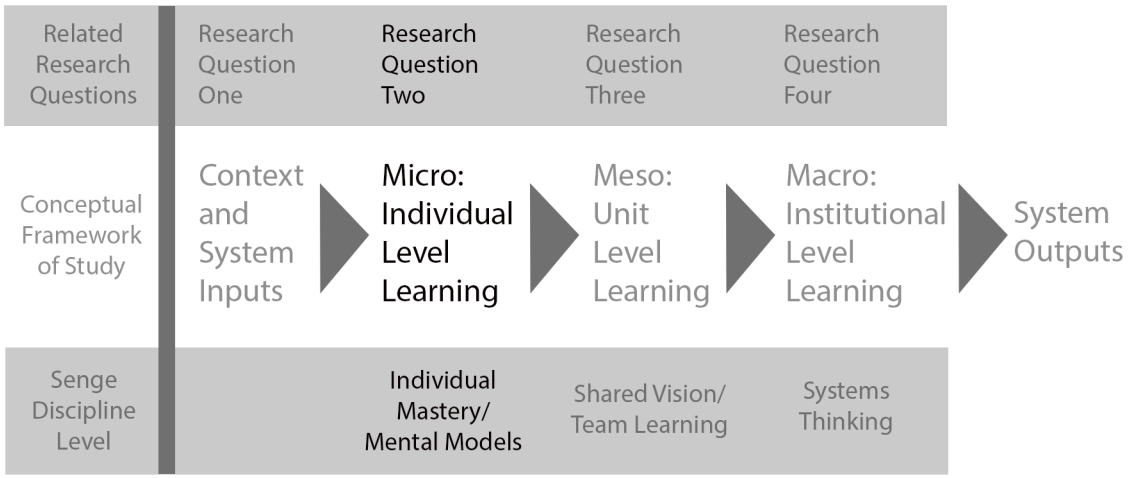

Figure 4.2. Research question two within the study's conceptual framework.

Figure 4.2 shows the correspondence of research question two with Senge's (1990) concepts of *individual mastery* and *mental models*. This section presents the study's findings according to these two disciplines, from the perspectives of senior and unit leader participants.

Individual mastery: Senior leaders. Senior leader participants described the *leadership skills* they used to lead improvement projects and how they approached their *personal learning*. They managed *change, communication, complexity, culture, employee fear* and *work volume* as required management skills. They described managing e*fficient learning, learning about Lean* and *workplace awareness* in order to enhance their levels of personal learning.

Managing change. Dave described workplace change in terms of employee productivity. People tended to resist workplace changes due to inertia: since things have always been done a certain way, change was thought to be unnecessary:

> That's the end result, but getting there is the challenge and people resist change. Some people are excited by it; others are challenged by it. Some people say 'we've always done it this way', and perhaps because we've always done it that way there is not a focus on finding another way.

Paul talked about managing change in terms of how the improvement project could prompt new ways of thinking about service delivery and efficiency and the implications of related change:

> This opened up our eyes to 'how are we doing this' … and we really had to think this through. What were the implications of the change to our work and workloads: is it going to help become more efficient? Will we need more people?

He described the impact of generational change and how it was necessary to push back against aspects of working in alignment with previous patterns:

> I'll give you an example: my lab managers here for the most part are pretty seasoned people, we haven't changed a lot. We have our own biases, maybe a bit stuck in our ways. So I thought: let's try something new.

Susan discussed change in terms how employees viewed things that could be adjusted in the workplace. Even when confronted with resistance to change, she remained optimistic about improvement:

> We asked them 'what are your suggestions, what can we do, what can we change' … but people don't want to change. From where I sat I saw some things that

> could change, but people couldn't suggest a way forward except to say 'we need more people' … but that's not an option.

Managing communication. Dave noted that it took much more energy to manage misinformation than it took to manage information that had been carefully and effectively communicated:

> The rumour mill can operate at high speed, and that channel is always pretty much always incorrect … [rumours such as] 'Lean gets rid of people' … or at least that is the perception.

He observed timing issues regarding communications; specifically, because Lean projects were launched alongside wider institutional efforts to conserve financial resources, a perception formed that the improvement project was linked to cost savings. He described the early phases of an improvement project as useful for communication and establishing project "buy-in". Communicating the initiative's vision was important throughout the project to encourage positive morale, and project objectives should be based upon the functional areas that employees would see as most important.

Paul emphasized the need to accommodate learning styles when communicating project details and a need to consider that employees need lead time to consider the possible implications of improvement projects:

> We had to look at each individual's learning patterns and how they learn, because I've got people there who do it very intuitively and just grasp Lean right away. But we also have some people who need time to process this … to watch somebody do it first… to think about it.

Susan also described a need to manage misinformation that can emerge during improvement projects. She described the effects of misinformation in the context of faculty members who were trying to ascertain information to do their jobs:

> Faculty, I feel sorry for sometimes, because they are trying to figure things out with the information available or the rumour mill … it is a lack of clarity, which is partly the nature of where we work.

Managing complexity. Dave described increases in workplace complexity and how this has been compounded by workplace generational changes. Specifically, he noted the effects of complexity regarding an organization's memory:

> Yes, and whether is it documented or not … there are a lot of positions that are no longer here. We are in a bit of a phase with the baby boomers retiring … and a lot of organizational memory went out the door. In our case, that could be knowledge about tunnels, conduits … what tends to 'back up' and 'we used to do something to fix that issue', for example.

He felt that the volume of simultaneous changes made it difficult to understand what the implications were for any one initiative. Staff training and development can mitigate complexity. However, even with such investments, he observed, "people change roles in organizations, leave organizations … more rapidly now than in the past."

Susan described complexity in terms of the number of employees who are involved with administrative procedures and how the interrelationships of such professionals impacted process flow:

> Our director of finance, our development officer, our director of academic affairs and an academic coordinator [all work] with systems. This means working

through the terms, making the award, doing donor acknowledgement. One of the issues that we have had is that these processes have a lot of people involved, and there are a lot of required steps to doing this.

Susan noted that problems arose when "two or three people try to do the same thing", causing a disruption to the workflow and miscommunications. She noted that collaboratively creating workflow diagrams was a successful strategy to develop common understandings of proposed changes.

Linda described the problem of managing complexity from the outset of an improvement project, given that some workplace issues seem unmanageable:

> I didn't know how big of a mess it really was … and once I got into it I could see why I was getting daily complaints, so that was maybe a revelation to me. I think I realized that the stockroom people were frustrated and didn't know how to cope with problems. They just knew it was a mess and everyone was mad at them and there was conflict daily about this issue, but I don't think they understood how to get out of the mess.

Linda noted that with heightened complexity comes heightens anxiety about decision-making, but it was improvement project decisions that permitted new efficiencies. She emphasized the "why" of the project throughout the initiative so staff did not overly focus their efforts on the detail of the "cleaning and the sorting … but more in what we were doing and why we were doing it."

Managing culture. Paul described how different employee groups on campus regard their contribution to organizational requirements:

> It's very different: when you look at something like facilities management, financial services or security … they have a completely different view of why they are here than the academic departments and colleges do.

With respect to how employees view their own culture in terms of speaking up about issues that concern them, he noted that employees felt that they could not speak up at all, even when asked to do so as part of improvement projects:

> For a faculty member in a tenured position … talk about whatever you want … [but] for the administrative people that work on these processes … they are definitely not encouraged to talk about it … it's a big 'no-no'.

Susan talked about the university's culture as being political with significant differences between administrative and academic staff cultures. When proposing or managing change initiatives, she observed cultural chasms between affected groups. She felt that openness about the administrative intents of change promotes trust. She proposed proactive strategies to find out what people were thinking or where challenges existed in their work. She advised senior leaders not to "overinvest their time" managing workplace culture, as it was not always clear that such efforts were "a good use of time." With Lean, she felt that the "teambuilding that comes with that is good", mitigating an effect where, "at the university the emphasis is on the success of the individual."

Linda noted tensions between individual and group workplace goals. When individuals working in a department could only see their own goals, inefficiency would be the result. Specifically, regarding the Lean project, she noted:

> The one gem of the whole thing was we finally got some idea about the different stuff we had, what was the best way to store it … without everyone doing the typical 'I want it my way' approach … and getting that ground force involved.

Linda described changes that occurred through the lifespan of the improvement project. During early phases of the project, she observed that employees claimed that leaders "aren't going to listen to us anyway." However, she told them that she "would take their opinions into consideration", and later she felt this resulted in a more positive work culture. She described this effect of the work culture as "the part I liked best about the whole project … we've got their buy-in to this day."

Managing employee fear. Dave described several occasions where it was necessary to manage aspects of workplace anxiety related to improvement projects:

> A number of folks are concerned, or worried is a good word, about whether or not they are going to have a job next week. People worry when they hear the word Lean, because 'Lean gets rid of people' … or at least that is the perception.

He described fear as separate from a fear of reprisal or termination: specifically, it was a fear of workplace changes and their implications. He stated that many employees predicted negative effects from improvement projects or efficiency, claiming, "some people think they will end up working harder … or fear doing things differently."

Susan observed that workplace fear and anxiety correlated with learning experiences. In particular, Lean training sessions revealed, "who is flexible, who is feeling threatened and therefore aggressive, who isn't saying anything … and why aren't they saying anything." She noticed various levels of comfort when employees expressed their views in a group setting. She observed that some employees were "fairly assertive

about giving opinions and questioning", while others were reticent, depending on their outlook or organizational role. Some employees dominated conversations due to a "discomfort with silences" or a perceived need to keep "the discussion going." She often noticed that staff members "most impacted were the most reticent" when discussing improvement project issues.

Managing work volume. Dave described an increase in expectations of work volume for his department and the resulting effects on professional expectations:

> I long for the days, say five years ago, when Fridays were kind of a 'clean up' day, a catch up day, where now you are running 110 kilometres per hour and looking at things 7 days a week. [I feel like] the juggler who has 3 or 4 balls in the air at a time, but some days I feel I'm up to a dozen … and they keep dropping.

He felt that increased work volume had implications for organizational learning and project planning. He claimed that increased work volume meant that he had to prioritize efforts and measure returns. He described a "trade-off effect" that occurs when launching efficiency initiatives, as there is "a learning curve" that requires initial investment.

Paul described his approach to managing work volume as providing support for employee learning and ensuring an effective organizational structure:

> So my job essentially, is to oversee the facilities. I have lab managers under me that report to me … and we help facilitate the research labs. They are there to help the researcher do the administrative stuff: we help them do the health and safety administration, which can be onerous for them. It takes time away from their work, and it takes time away from their people's work. So we help them do that.

He noted that the improvement project resulted in fewer clerical mistakes that held up the ordering of supplies. The improvement project helped clients who did not know fund numbers, removing unnecessary processing delays.

Susan described aspects of managing work volume in terms of the learning curve for new employees. Specifically, she described a situation where a new employee joined her department halfway through an improvement project:

> We have a new staff person who started a year ago and it's all new to him: it's a big learning curve for that job. We will follow up with all the staff eventually, I want to make sure they are happy and it's working for them.

She also expressed the result of improvement projects in terms of how employee time was conserved by changing how processes were handled:

> It has been amazing in terms of the impact. The one small improvement that we asked the university to do, graduate studies, had to do with the graduate applicant's request for letters of reference. Staff used to have to go through a multi-step process: we calculated that they saved 40 hours of work.

Linda described a positive effect of managing work volume to overcome organizational inertia:

> It's hard to come in and make significant change without a … well … a project. With a project we have people come in saying … it's going to be special … and that helped fight the momentum of 'I'm busy, I don't have time to do that'.

When she was asked if the organizational improvement would have occurred in absence of a formal project, she replied, "probably not. I honestly don't think we would have."

She described a trade-off when leaders engage in change initiatives; that is, taking on new initiatives sometimes means ceasing other initiatives.

Efficient learning. Dave talked about applying efficiency concepts to his own learning. Specifically, he had changed his management practices to work primarily with digital documents. He described this efficiency improvement as a "double-edged sword", because he had unwillingly become "part of the electronic world … and never really being truly on vacation."

Paul talked about his own learning as it related to project planning and the timing of efficiency projects. For example, they launched an improvement project during the summer months, which he described as "not the best time to do a Lean project", due to barriers to efficiency caused by as employee unavailability.

Susan described her approach to efficient learning as setting aside uninterrupted "time on task" for project work. She described departmental learning systems in place prior to the improvement project as, "leaving sticky notes for people … which worked … but people couldn't get their work done because they were constantly interrupted." She emphasized that time on task was a key requirement for improvement project success.

Linda described her own learning efficiency in terms of her ability to manage her time and employee time. Specifically, she talked about breaking her own work patterns when seeking workplace improvement. By establishing new procedures as part of the improvement project, employees were freed from their previous work patterns.

Learning about Lean. When asked about learning about Lean, Paul stated, "for this project, we didn't really get into what Lean was all about", further detailing that his team "never really understood how Lean was supposed to work … because that wasn't

really given to us." He commented that similar improvements could have been realized in his department even if a different improvement methodology was used.

Despite participating in Lean training, Susan claimed that there was "a chunk of Lean I still don't get". She recalled that since they only used a few Lean concepts or tools there was still "a lot to learn" regarding Lean and retaining concepts was difficult "because it's not something I use all the time". However, she felt that "every time I used it, I made a new connection", emphasizing that reinforcement was possible with continued use. She found that "the more you worked with it, the more comfortable employees became", easing "the counting of things, such as tracking time."

Workplace awareness. Paul described the advantages of developing workplace awareness in the context of learning more about typical employee operations:

> The learning that I had to do was to get more involved with how stores operate. I may be the manager of the stores, but I don't deal with the day-to-day stuff. I really didn't know the details of how things worked; I didn't know what happens when an order comes in.

He felt that learning more about the operational aspects of his department was helpful when leading change initiatives. However, with simultaneous projects occurring in his department, he said it was "a challenge just finding the time to commit to doing this project and on the very short, tight timeframes", therefore, impacting his ability to further develop his workplace awareness.

Susan also developed workplace awareness as a result of participating in improvement projects. Early project stages involved "a lot of learning … and learning

from other people." Training sessions were a "great way to see how people worked", revealing a better view of the relationships between people and their administrative areas.

Linda talked about the systems approach the university could follow to encourage better workplace awareness. Lean required "talking to the people who do the work … and I just don't think at the university we are good at that." She further noted:

> If we could learn that, I think the whole university would be better off. People generally don't do stuff to irritate other people … not trying to be inefficient … … but I don't think we stop to ask them 'why are you doing it this way'.

This second research question elicited categories and subcategories that were related to the personal agency of participants, the agency of their employees and aspects of workplace climate and culture that affected performance. Senior leaders viewed personal learning in terms of how to communicate with employees and mitigate cultural aspects that impeded performance, such as managing fear and miscommunication.

Individual mastery: Unit leaders. Unit leader participants described *individual mastery* in terms of how it *affected professional practice* and their *personal learning*. They described how *affecting culture*, *enhancing efficiency of processes* and *managing work volume* influenced practices in their work environments. They also described how *learning about Lean* was important when enhancing personal learning.

Affecting culture. Jill described how she was able to affect cultural change by sharing the results of an improvement project that had occurred elsewhere on campus:

> We used that as reference materials for ourselves … made sure that our shelves ended up clean and organized at the end of the day. We still found stuff in the last year since we have had a changeover in staff … the new staff are quite keen at

> looking at this stuff … we had chemical pails that had been falling apart … there was never any oversight before that about how long things had been sitting there.

Kevin described the concept of a "learning code" that undergirded university employee and faculty culture that potentially created a barrier to change:

> That's like a formal code that the university follows … somebody had to write it down and learn it and teach it and implement that. Whether it was right or wrong, that's the learning code of the institution … and that's why it's harder to change that learning code. If it's been done that way for years, it's harder to change the method … eventually two generations, or three, from now, there will be a different learning code.

He also talked about his view of the organizational work culture as it related to the training and development of university employees, as well as some of the advantages that Lean could present to help people do their jobs:

> From what I've seen over my 4 years here at the university is they have lots of people who work here that have no idea how to properly do things, who were never properly trained or sent in the right direction. Some people took the right training, went through the system, would know how to properly run stores for example. The Lean program could eliminate 50% of all issues if it provided a proper procedure, directions to follow and a proper system, whether that is inventory system, a billing system or any other kind of system.

Enhancing efficiency of processes. Jill described efficiency enhancements resulting from new processes and changes to employee behaviour:

> We are still going through that process … but staff were resistant to going through those kind of administrative procedures before because they felt they never had time. But they weren't using their time properly … and this factor came up as part of the Lean team initiative.

Kevin talked about how processes could be made more efficient with a common institutional direction about efficiency projects:

> There is no consistency, no general leadership or format on who you report to so everybody goes in their own direction. This Lean program, with its flowcharts, could show all of the common problems. You could then decide how to correct them. There are certain ways to do it: you follow certain procedures or methods used in proper business, running a store is straightforward, you have to follow this direction to get the product in and sell it; to take orders, order product, get it and distribute it. And doing that from the top could mean the Lean initiative could help standardize practices.

Chris described the advantages from promoting efficiency in his department; however, he did not think that Lean was necessary to enhance efficiency. He expressed that he did not necessarily want to use Lean in future projects:

> Because there was no payoff … putting things to front, arranging where to put stuff overall. You know, if I had a business and someone said 'do Lean', I'd say 'no' and save myself $60,000 or $70,000 for something that I already know how to do. If I run a business, I don't need Lean to tell me how to set up a stockroom.

Managing work volume. Jill described how the improvement project introduced new tools to better manage inventory in the supply stores:

> Because we had this issue with the sign out sheet at the front window, we developed a card reader system. Unfortunately, it took more time to do the entry, because our stock is not barcoded. I mentioned to you it was a bridge built halfway: the other half is the ability to scan. We are revisiting that aspect to get it into play, because then we would have the ability to get rid of that sign out sheet.

Kevin talked about goals he set when taking responsibility for the health sciences supply centre. The goals related to managing work volume and becoming a centre that could allow researchers to focus more on their research rather than administrative tasks:

> When I took it over, my objective was to offer them a service to say "everything that comes through the building comes through this store so I can find out what's bought, and what should be bought. If you come pick it up, then I'll do all that paperwork for you. Within 6 months, that service was implemented and all the researchers over there embraced it.

Learning about Lean. Jill held the view that learning about Lean provides benefits to individuals, those in charge of academic units and the whole organization:

> There's really been precious little discussion about it from the top down about what the value of this is. There has been really no discussion about this institutionally, and maybe it's because people wouldn't pay attention to it any way, but then you can't evaluate things when you are not exposed to them. In an institution of higher learning everyone should be focused on that.

Kevin talked about learning at the organizational level as it related to efficiency initiatives and how such learning is captured:

> The institution, over time, will learn something. There is documentation of procedures that are followed year in and year out, and that which it has learned. That's like a formal 'code' that the university follows and somebody had to write it down, learn it, teach it [and] implement it.

Unit leaders talked about how personal learning enhanced their leadership styles relating to managing their own workload and the workload of their employees. They also noted how the use of effective communications could diminish certain workplace tensions, anxieties or fears related to implementing change initiatives.

Mental models: Senior leaders. Senior leader participants described mental models in terms of the *affective domain* of project participants and *industry best practices*. They described aspects of *enhanced employee motivation* and *feeling a sense of momentum*. They also described *increased centralization and planning, enhanced customer focus, participatory approach* and the *use of measurement and standards*.

Enhanced employee motivation. Senior leader participants reported an increase in employee motivation when project gains became evident to team members. Dave described this through the results of an improvement project:

> The transformation brings a level of excitement … when you can see 'hey, this is starting to fit together' … so the end result will be a much better work area. A work area where other people can find the thing they need to find.

Susan also reflected on the results of the efficiency project contributing to enhanced employee motivation regarding enhanced participation:

> Because you get the participatory thing, which is real, not lip service, and people feel involved. There's more than one way to approach projects … you don't have

to follow all of the particular pieces … some will work better than others. You get immediacy of results; you don't have to wait 2 years to get results. I would think that would be satisfying.

Linda described a sense of workplace pride among employees that she observed as a result of the improvement project:

As soon as someone came in to mess things up, they would tell me and we will go find out who is messing it up and try to straighten it out. They needed to know that what they did would be maintained. Even just taking down one row on those shelves … the guys in the stockroom loved it … they were so excited.

Feeling a sense of momentum. Susan described a sense of momentum resulting from the improvement project that encouraged her staff to continue fixing departmental errors even after the project had been completed:

There has been a lot of good work done for process improvement there, and sometimes, what I'm finding is that we get going … issues get fixed, and we don't go back to the Lean project because we already have momentum.

Linda described how gains from the improvement projects could be preserved through the metaphor of maintaining a household:

We are going to go back and review our principles, but it's same as how you might run your house. You have to avoid chaos, so, especially in a group of people, you have to keep that going. Staff need to now put in the work … the upkeep and maintenance of it.

Linda talked about how a sense of momentum affected the collaborative learning experience of team members as they worked together to divide tasks:

> They worked together, so all of the sudden we'd find something had to be done … and people started saying 'OK, you take care of that and I'll look at something else.' They worked and learned together … so they divided up the job by teams … they did work together as a team.

Increased centralization and planning. Paul talked about centralizing and planning services through improvement projects. He described efficiencies gained when they used "the same volunteer or simulated patient" to train future physicians and nurses rather than arranging separate equipment or people. He described different philosophies that he has encountered in his workplace relating to inventory management or the setting of prices:

> If I talk to the finance people, they do not understand why we don't have a mark-up, whereas, a researcher is going to say, 'ok fine, mark it up - I'm not ordering from you.' I will pay my technicians to do the ordering instead.

He expressed a view that centralizing services naturally enhances efficiency despite some of the modes of thinking he has encountered in some departments:

> So we are going to pay a researcher $150,000 per year to do his own ordering and card reconciliation … which, he does once a month, screws it up … we have to go back and do it again for him … and he gets madder and madder in the meantime?

Enhanced customer focus. Dave described his approach to inventory management in terms of a retail shopping experience. As he described it, the same efficiency concepts apply when considering customer experience:

> I was at Staples looking for a laptop bag because they had one that was on sale, but they couldn't find it. That ends up being a waste of 'motion' … and that's probably why retail is starting to suffer a little bit.

Paul talked about enhanced customer focus in terms of the experiences of constituencies that faced frustration with previous ordering practices:

> The biggest issue we had at the time … when people came to the stores to do orders … they don't know the fund numbers … so we are constantly putting the wrong numbers in … and having to turn around to make corrections … irritating the researcher, finance and it's taking us double the time.

Participatory approach. Dave reported the improvement project's participatory approach as very important to project success and group learning:

> Actually the project worked quite well, we did it over 2-3 days, there were a few others involved. We got rid of the junk, we cleaned up the place, and we reorganized the place. There is a learning phase to the project: it's participatory.

Paul talked about the importance of the participatory approach both from his direct experience and information about improvement:

> There is a participatory part of Lean: based on my investigations, it doesn't always work unless there is that participatory thing. It seems to 'give voice' to people who otherwise might not get their opinions into action.

Susan described the strength of the participatory approach in terms of group decision-making and using project facilitators:

> So not only were we able to solve the application thing, but we solved it very simply using the tools in Lean … that process really helps. It seems like a lot of work, and if it's facilitated well; really, the facilitator does most of the work.

Linda detailed the impact of participatory decision-making relating to progress meetings and the group's capabilities for progress and learning:

> We would meet once a day to talk about what the big issues were … we decided as a group what was going to happen. And it's not rocket science, it's not complicated, it's not hard for people to grasp … they get it. Even if the staff members change over time, the group will know overall what to do.

Use of measurement and standards. Dave talked about the tradeoff between standardizing services and who ends up doing the work:

> It saves money as well as costs money to create purchase order … on the flipside … what is the risk in offloading work on departments about this sort of thing?

He also talked about the impact of standards as they related employee learning:

> There was no standardized or sorting type thing where shelves were labeled … perhaps if you were brand new or second day on the job … if someone comes in looking for something … how would you ever find it?

Paul talked about measuring the results of an improvement project based upon progress in managing inventory. He described this as follows:

> We are trying to do less inventory, it's just-in-time ordering; most companies nowadays have overnight shipping. We had $200,000 worth of inventory when we started, and to modernize it, we are down to about $60,000, and we'd like to keep it at less than that.

Susan described using time as a standard to measure project success. In absence of measurements, she was unsure about how to guarantee improvements:

> We are able to set timelines … we know we will turn something around in 3 days for example. But without identifying the fact we could turn it around in 3 days, we wouldn't be able to put that out there as we would fail.

Susan also talked about how departments supported the use of standards, but wished to align with existing approaches:

> Some departments are still coming along, but every department did things differently and we have yet to achieve standardization. Everyone agrees there should be standardization, as long as it's the standard they've already been using.

Linda talked about the impact of a lack of standards on workflow and employee motivation, noting this might cause staff to focus on blame rather than solutions:

> Certain people wanted things done one way; other people wanted it done other ways. It was coming to me continually … 'we can't find anything' and 'it's this person's fault' or 'another person's fault'.

Senior leaders talked about the tradeoff of requiring strict standards to ensure consistent service delivery and opening up the freedom for employees to take a participatory approach to implementing departmental improvements. To them, mental models represented the bridge between these concepts and achieving departmental goals.

Mental models: Unit leaders. Unit leader participants talked about mental models in terms of the *affective domain* of project participants and *using industry best practices*. They described the *value of employee intuition* when considering improvement projects. They also described *enhanced customer focus, common inventory practices,*

promoting standards and measurement and *promoting workforce training* when describing industry best practices they employed in their work setting.

Value of employee intuition. Kevin believed that employee intuition was valuable for determining where organizational problems exist:

> That's where it begins from, from people, but that is why you need people. If you had a production line, then once you program it, then it runs all the time the same way … until somebody who has a gut feeling decides to change it again … but that gut feeling has to come from somewhere.

He related his experiences touring a Japanese factory, describing it as "a whole different mentality … a different structure" where employee intuition is so valued, options are available to employees to slow down the production line or halt it. He believed that beyond direct observations, employee intuition was key to the success of that approach.

Chris presented a view that employee intuition, or just common sense, could constitute a better approach to improvement than improvement methodologies:

> The whole Lean thing was just common sense. I'd be saying 'here's a better way of doing it' instead of using Lean. Sometimes people will do something over a whole day that could be done in 20-25 minutes. I've run into that quite a bit. They need to find the best, fastest way to do things and avoid time-consuming things.

Enhanced customer focus. Kevin talked about departmental changes that have occurred to better accommodate the needs of customers:

> The big thing is probably how the service is to be provided to the researcher. That's the biggest change of the whole thing … there was no service before. They didn't really order anything … they were here to sell items that were in stock.

Chris talked about how the university bookstore has become more focused in recent years to assisting customers with specific requests:

> Now the emphasis is on helping the students: we say, 'what books do you want - I'll help you find them.' When I first started, we tried to teach the kids how to use the bookstore … but now we do everything for these kids.

Common inventory practices. Jill described how proper inventory practices, along with the mental models that accompany them, are requirements for improvement:

> The object of Lean is to not only look at your processes, but look at how you are utilizing your space and to look at your turnover of your items in there. There wasn't a count done since 2005, and they are supposed to do an annual count to balance the books, it's in fact a requirement, and somehow they had dodged it because there was not enough time to do it. In the first year I was here I pushed for it to get done, so the Lean project helped with that effort.

Kevin referred to institutional problems resulting from a lack of industry-compliant inventory practices:

> The pace, record-keeping … there's lots of different things that go on in this university that are not correct. They don't have proper inventory control systems, they don't have proper management control systems in different areas, there's no accountability … things are always changing.

Use of standards and measurement. Jill described the negative effects of a lack of standards and measurement. She saw this as caused by an inward focus exhibited by some departments and a lack of leadership from university administration.

> I find that is endemic to the university, everyone works in his or her own little world … very much like a kingdom with their little fiefdoms … and they don't really talk to each other. Even the higher levels, where you should be getting your direction and guidance from, are not providing that direction.

Jill further described where university decision-makers could look for new mental models regarding the use of standards and measurement:

> All they have to do is look at industry; you know, I'm not one for reinventing the wheel. If they have some cases that have already been done in other universities, because the systems are the same. But here, there has been no consistency in terms of doing things or establishing job structure.

Promoting workforce training. Jill reported that workforce training was key to ensuring that mental models held by employees suited the nature of the improvement project. Specifically, she related a situation where a lack of training held up progress:

> It has somewhat hampered us from moving ahead as quickly as we'd like to on some Lean things …but you know, the learning is there and new staff are much more open to uptake of these objectives.

Kevin described the positive effect workforce training had to ensure consistency of service between team members:

> I encourage this whole team to share and overlap responsibilities … there is always someone there who knows how to do the job of the other people. I don't like the phenomenon where only one person knows how to do something.

The mental models conceptualized by unit leaders brought together requirements for workplace standards and affective domain issues, such as valuing employee intuition.

They saw this blended mental model as suited for ensuring a clear customer focus for employees and one that would encourage personal learning among employees.

Research Question Three

The study's third research question was, "What are the implications of these efficiency initiatives for organizational learning at the departmental or unit (meso) level?" This research question is presented in the context of the study's conceptual framework as follows:

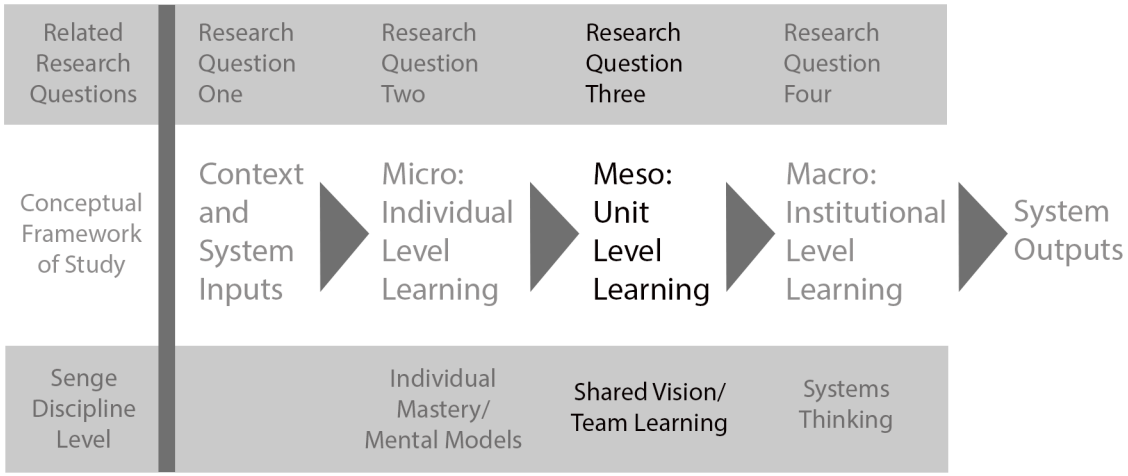

Figure 4.3. Research question three within the study's conceptual framework

As viewed in figure 4.3, this third research question incorporates aspects of *shared vision* and *team learning* per Senge's (1990) model for organizational learning. The following constitutes participant data for this third research question sorted by these two parts of Senge's (1990) model.

Shared vision: Senior leaders. Senior leaders discussed *shared vision* in terms of how it was *established at project inception* or *established through mission*. They related how shared vision was *established through buy-in* and *established through training.* They

also described aspects of an *institutional mission of efficiency* when linking improvement initiatives with institutional mission.

Established through buy-in. Dave described the "buy-in" project phase not only in terms of project inception, but as being important through a project's life cycle:

> There is also the buy-in phase; the learning sounds like some extent of learning over time … and then from a time perspective is that a number of weeks or a number of months?

Paul described the democratic effect of a buy-in phase in terms of how people negotiate with each other at project inception and jointly develop a shared vision:

> It makes a level playing field … everyone on the project is asked their opinion, what they think … and people like being asked what they think. If you had a retreat … there might even be a certain level of verbal bullying … but when you have a mix of a team like these Lean projects, I haven't seen these things so far.

Linda talked about how a buy-in project phase brought together employees and managers to address long standing departmental issues that were previously neglected:

> I don't think anybody ever asked the stockroom people what the values were of both approaches … and I think we got the manager to see that this result was efficient … we got to a compromise.

Established through training. Dave described a link between the project orientation/training and establishing group "buy-in" about the project vision:

> A few of the folks were not familiar with Lean … there was an orientation session set up. Getting 'buy-in' and setting up expectations about the end result, which took a bit of time, but then we got them to see the vision.

Paul talked about using training as a means to not only establish a vision, but to hear more about the opinions of project participants:

> We did one over a month and then we rolled it out to specific researchers and technicians … we had group sessions with them … just to see what they were thinking. We did the same thing when we rolled it out to the whole group.

Linda talked about how shared vision served as a predecessor to project phases that involved doing the project work:

> I think we started way back with how we share our opinions, how we make decisions, how we want to move ahead, to give people an idea of where they are going. And after that it was all practical: we started doing project tasks.

She further described how establishing a shared vision created an environment where team members felt valued and felt their opinions were heard:

> I think the team members were pleased to be heard, which I think is important. So much of the negative talk stopped and turned into talk about how we could do things better.

Institutional mission of efficiency. Dave talked about the effect of describing concrete examples of efficiency when establishing a project's shared vision:

> As more people understand that and get that vision … then maybe there is a better way to do whatever that is. Often you will see in a shop a pegboard with hooks and you see the 'outlines' of the tools … when you look at that you 'know that wrench is missing'.

Paul theorized about the applicability of Lean methods to wider academic functions of the university and how the shared vision of collaboration might work:

> So one might ask: how does Lean help my teaching? How does it help my research? I've watched in Nursing how programs and classes are developed: it just goes all over the place before they get to where they want to be because the university insists on collaboration. You can't just predict it's going to go step by step by step, you have to consult with everybody involved numerous times, so I'm not sure how Lean works with that.

He also talked about learning capacity as a key predictor to knowing whether or not collaboration would be possible for some employees:

> We have a long ways to go to be completely successful: it depends how well the group of researchers have come together. If the researchers have learned to be collaborative, then the lab manager can succeed. If they are all trying to be individual researchers, then lab managers are not as successful.

Senior leaders believed that some aspects of a shared vision existed before improvement projects (such as institutional vision) and others would form as part of the instantiation of improvement projects. In their view, a number of possible intervention points existed to communicate or reinforce the shared vision of improvement projects.

Shared vision: Unit leaders. Unit leaders discussed *shared vision* based on how it was *established at project inception* and *through mission*. They related how shared vision was *established through training*. They also related how shared vision was established through the institution's *missions of efficiency and safety*.

Established through training. Jill talked about a variety of educational resources that were made available during the improvement project's training phase:

> We saw one that showed the transformation of the bookstore and a PowerPoint presentation and video that described 5S and Lean. We ended up on the same page about the reasoning behind Lean, as it showed the before and after with respect to the bookstore. When people saw this, and humans are visual creatures, when you see something like that, then you start understanding the value of going that route. It opened their eyes to the purpose of why we did this.

Kevin talked about the use of shared learning to encourage a longer-term shared vision that would persist even if key employees left the organization:

> This place would be fine, because of its procedures and keep operating, maybe slow down a bit … but overall, fine. My goal before I leave here will be to enable a turnkey operation; that is, the next person who comes in will see there are procedures for everything.

Mission of efficiency. Jill described how a shared vision of efficiency could be used to develop a project's shared vision and help ensure persistence of results:

> I think the people involved with it, they viewed it as a success, but somewhat limited in some areas … and somewhat limited by staff member participation, because there was some resistance there. I would say success had changed since the Lean project … things are much more organized down there, much better tracked, much cleaner. That has led to efficiencies in terms of how space is used.

Chris described the shared vision as it emerged from the improvement project as a very direct expression of basic workplace efficiencies:

> They had a vision … it was to 'eliminate unnecessary steps' … hence the 'move what you sell the most over here: move what you sell the least over here' kind of

thing. And figure out ways to use as few steps as you can. If I have to go see three people about something … is there a way to maybe go see only one person?

Mission of safety. Jill described the effect of linking a project's shared vision to the safety requirements of her department:

> If you are storing a bunch of [gas] tanks and you are not getting turnover then why are we doing that … rather than hoarding to a point where you are blocking the exit. So that got corrected quite quickly. This is the thing about Lean … once people see the reasoning behind it and the values behind it … then attitudes began to change … they started looking for ways to accomplish those objectives.

Relating to shared vision, unit leaders held views similar to their senior leader counterparts. In their view, a department's mission of efficiency and safety might be a reasonable starting point to establishing and maintaining such vision. Effective communication at projects inception and during a project was required for success.

Team learning: Senior leaders. Senior leader participants discussed *team learning* in terms of *managing tensions* and *project flow and definition*. Senior leaders related how they managed *individual versus group goals* and *team dynamics.* They also related the effects of *formal versus informal projects* and *prioritizing projects*.

Individual versus group goals. Paul noted that tensions often exist between individual and group goals in a university setting. He described how these tensions become apparent during improvement projects:

> Individual researchers, they collaborate when it makes sense to, but they do their individual research 60% of the time. It may be in a group setting, but their grad students, post-docs, technicians work as a smaller group within the larger group.

Susan spoke about her observations about the individualistic nature of students hired for jobs in her department:

> When I interview students for jobs, their reports about teamwork are not happy ones, and that translates to the workplace. So there are behaviours that maybe we can develop in ourselves to help work through that.

Linda talked about tensions between individuals and groups in terms of a metaphor of how one's home is managed:

> It's a little bit of a combination of learning on a number of groups' parts. If your house/bedroom is a mess, and you clean it up, and tomorrow someone comes in a messes it up again, it demotivates you. Why should I clean it up?

Team dynamics. Susan talked about the interpersonal dynamics she observed between team members relating to aspects of power:

> There are a couple of dominant voices there: one a long term manager from the department who is fairly assertive about giving her opinion and questioning and a staff person there who previously reported to her but is now centralized, who really didn't say much but I don't know if because she didn't want to challenge her, or if in the large group she wasn't comfortable doing that.

Linda described tensions between team members at different administrative levels during the early stages of the improvement project:

> One of the first things was that some of the lower level/clerical felt was, 'if I give my opinion, is anyone going to listen to me?' And there was a fair bit of animosity between that group and one manager, because up to that point that

manager was imposing her point of view on them and they felt 'well, we will have to do what she says' so there was this underlying tension.

Formal versus informal projects. Dave described the benefits of pursuing improvement projects that followed a clear methodology:

> I think here on campus, and I forget how many people were trained on Lean, there are also 'little projects'. I've got 2 on the go, one is formal and one is not as formal, and that was the goal that this is one way we could start 'spreading the word.' I think that has been effective.

Paul also referred to the existence of formal and informal improvement projects, noting that he has found the more formal projects to pay the highest dividends:

> I haven't heard much about Lean on campus, but we actually did go and do something, we saw a result. I know there's a lot of these minor, little ones, but ours has been probably a bigger return than they ever thought it would be.

Linda talked about the benefits provided from a formal project structure in terms of promoting change and escaping existing mental models:

> It kind of shocks you out of the normal with a direct project that clearly says, 'this is our overall goal.' It's like a Christmas tree: without that structure, the ornaments have nowhere to go.

Prioritizing projects. Paul described the need to prioritize projects and ensure they are conducted at times that suited the flow of an organization:

> So that was probably the biggest thing: we needed more time, it was really rushed. We found we were really pressed to do it [and] we probably didn't have as much consultation within our own staff as we otherwise would have. It would have been

nice to have the time to create a user's group and get input on what they needed. So now we are going back and making changes that help them.

Susan talked about using the shared institutional vision of faculty support to establish a priority for improvement projects:

> Unless we can be efficient and support faculty in their work, everything is going in circles. My impression or understanding is that resources should be placed for faculty, so we do have to make our administrative supports efficient.

Linda expressed her thoughts on how departmental improvement projects should be prioritized, given the time and budget constraints of the university:

> So that's sort of the big question mark in my mind: Lean is great, it works, but where are we going to put our resources and how do we get stuff to the forefront that really needs to get done?

Senior leaders talked about team learning in terms of how it represented a system among employees; and that system was naturally linked to other departments or projects. These leaders noted that system tensions arose if competing individual or group learning priorities emerged. The importance of differentiating "official" and "unofficial" improvement initiatives or projects was noted by this group.

Team learning: Unit leaders. Unit leaders discussed *team learning* in terms of *managing tensions* and *managing project flow and definition*. They described how they managed *team dynamics* in the context of building effective teams. They also described how they approached *establishing the why* for improvement projects when defining new improvement projects.

Team dynamics. Jill talked about the nature of working on a team as it related to the nature of how faculty members view improvement projects:

> I think there was a lot of skepticism on the part of the faculty at the beginning. They kind of have a view: 'if it isn't broken then don't fix it' and 'there isn't a problem if they don't see a problem'. There is always the possibility of skepticism or distrust from faculty on this kind of thing.

Chris commented that the use of an improvement project did not necessarily result in improved teamwork; he believed the elements of teamwork were already in place:

> I just didn't get anything out of it. The problem was we had too much stock and I told them, 'until we get rid of this stock we will never be able to actually achieve our goals.' We already were a team and we already knew how to learn things together, we didn't have to do all that other stuff.

Establishing the why. Jill described the need to establish the "why" regarding improvement projects. When serious departmental inefficiencies were discovered, these could be used to clearly situate the nature of problems:

> There were precious metals down there that no one seemed to know anything about. How long they had been there, what their original cost was, who owned them and what value they would be to the unit if they were to be liquidated. That is part of the efficiency down there: no one seemed to have any clue about this stuff being down there, even though they were precious metals. But that sort of speaks volumes about the lack of oversight down there.

She further described the use of a concept such as return on investment (ROI) to establish the basis for the importance of improvement projects and to report on progress:

They were trying to find concrete examples of progress, what the Lean initiative had accomplished. Because they were trying to report to their superiors: what is the payoff for these projects?

Unit leaders clearly explained the effects of negative team dynamics on improvement projects. Such dynamics could be caused by a lack of a common understanding of the "why" regarding an improvement project or not agreeing that a need existed for the proposed improvements in the first place.

Research Question Four

The study's fourth research question was, "What are the implications of these efficiency initiatives for organizational learning at the institutional (macro) level?" This research question is presented in the context of the study's conceptual framework as follows:

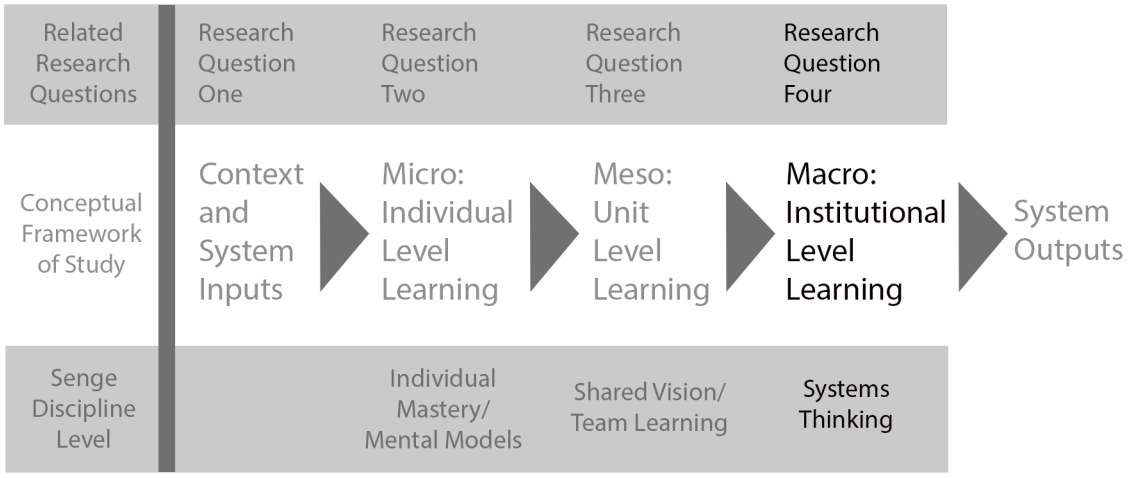

Figure 4.4. Research question four within the study's conceptual framework

As presented in figure 4.4, this fourth research question incorporates aspects of *systems thinking* per Senge's (1990) model for organizational learning. The following sections constitute participant data relating to this fourth research question.

Systems thinking: Senior leaders. Senior leader participants discussed *systems thinking* in terms of *system enablers* and *system stressors*. They described aspects of *centralization, collaboration, organizational communication* and *organizational memory* as enablers to improvement systems. They also described managing *change fatigue and organizational fear* to abate improvement system stressors.

Centralization. Paul described workplace changes that resulted in shared lab space for researchers and faculty and how learning was required for these groups to work successfully under this model:

> We are bringing people together to work in these collaborative labs; there are no individual labs anymore. There are shared benches and equipment, so we are trying to manage that and help them learn a new model for this, and this has been a major learning curve for faculty.

Susan described how the new centralization of systems was viewed circumspectly by employees in contrast with the former, distributed structure:

> There's been a lot of negative feedback on the finance side, which I found interesting because of the nature of the mistakes. I know just as many mistakes or more are made in departments, but personnel cover them and there is a lack of tolerance now that it is centralized. But because they had personal relationships with staff and departments, errors were covered. That has been the biggest blow in this: a lack of tolerance for the central system.

Collaboration. Paul described the institutional gains and anticipated gains from the systems approach to collaboration:

> It is something that was studied when we were designing the building; how do we do better research? The big push by the university is to get more dollars from tri-council agencies: have we been successful? Not yet, but we are probably looking 5-6 years down the road to where we will be successful.

Susan described the systems approach as something that takes a long time to establish and take hold in learning organizations:

> There's a potential over 50 years I suppose … speaking from an administrative perspective … and I guess if I were a researcher with a large research group … I could probably find some uses for Lean or parts of Lean to get things going … and to document it for others.

Organizational communication. All of the senior level participants stated that effective organizational communication is required to encourage a systems thinking approach to organizational learning.

Dave described specific communication challenges posed by improvement projects. Specifically, he found it difficult to separate the basis of efficiency initiatives from employee staffing levels. Frequent, clear communications were helpful to abate this phenomenon, in addition to giving employees chances to air concerns.

Paul talked about his experiences with past improvement initiatives, commenting that, in contrast to the recent improvement project in his department, the past projects resulted in binders being placed "up on the shelf … and nothing ever happened." The nature of Lean itself encouraged collaboration, and therefore communications about results were motivating for project teams, spurring other improvement initiatives.

Susan described examples where a lack of official, institutional information about improvement projects caused faculty and staff to rely on the "rumour mill" as their main source of information. She felt that positive, early efforts to communicate project goals and build consensus around the approach followed by improvement projects were useful.

Linda corroborated this impression, noting that the institution would gain much from informing faculty, staff and students about the results from the improvement project(s) and how such projects connected to departmental and institutional goals.

Organizational memory. Dave felt that even with proactive workforce planning, a system's memory is very difficult to maintain and share organizationally. Specifically, he talked about examples where employees no longer with the organization would know "how to make that certain thing work" or "why something was done that way" and he felt that finding ways to preserve and share that knowledge were very important to ensure the efficiency of services.

Susan talked about aspects of organizational memory she had observed at the executive leadership level. She described her observations as follows:

> There is that aspect of corporate memory … and my experience is that when new people come in … they try to re-invent the wheel. I think 'why do they do that?' For the new deans coming in: do they try to find out what the previous dean had been doing? Is there a lack of personal confidence that leads to that?

Change fatigue and organizational fear. Dave described opinions he had heard from employees where "Lean was the 'n^{th} iteration' of 'doing things better':

> So it's not a cynicism, but they are also thinking, 'is this the new quality circles'? If people have worked here for a while, they will probably have seen some of these things in the past.

He also talked about a number of recent departmental and institutional change initiatives and their effect on change fatigue within employee groups:

> We went through budget adjustments last fall, we went through a number of cuts and reorganization and as part of that; each involved exploration and selection and these sorts of things. The overall institutional planning project is rolled up on top of that. So there are so many things happening. It's challenging.

Paul described his early thoughts and trepidation about Lean in the context of viewing it as "yet another approach to improvement"; perhaps similar to initiatives he had been involved with in past years:

> I thought, 'Ok, I've heard about Lean.' It could be another 'one of these things' we have done over the years. When I was in healthcare it was the same feeling.

Senior leaders commented that, under a systems view of the organization, it was possible to enhance or detract the effectiveness of improvement initiatives through their leadership practices. These leaders commonly sought system enablers, and these approaches represented the use of effective communication with project participants to encourage good rapport and project momentum.

Systems thinking: Unit leaders. Unit leader participants discussed *systems thinking* in terms of *system enablers* and *system stressors*. They described *consistent policy and practice* and *organizational communication* as enablers to learning systems.

They also described *investing in systems or people* and *unanticipated consequences* as stressors to learning systems.

Consistent policy and practice. Jill talked about the advantages of the improvement project relating to administrative consistency. She envisioned future initiatives that could bring consistency to other campus departments:

> Part of the problem when you are looking at that kind of system is that there are several stores on campus and none of them have any consistency between them. We've been meeting about this as a purchasing group; we are doing that not from the Lean perspective, but more of an auditor's perspective, but we are bringing Lean along at the same time.

Kevin talked about the state of policies and practices on campus from the perspective of organizational consistency. He believed policies and practices were often based on individual preferences rather than centralized direction:

> There is nothing consistent across the campus … none of these stores that operate on campus use the same direction. They are all built based on an individual who was in charge originally … and it's still that way. I'm in charge of this store, and to be honest, I'm running it 'my way' and that's because there is no central direction from the overall system.

Organizational communication. Kevin described his view that communication "up and down" the formal hierarchy rarely occurred for important issues and senior university administrators were largely unaware about broad aspects of service delivery:

> I don't think people 'upstairs' know that this has changed; some people want change but others don't. My impression is that the university doesn't know that I am running a 2 million dollar operation on a $125,000 budget.

Chris talked about the lack of overall communication about Lean initiatives he observed on campus and the resulting lack of awareness of where Lean is having an impact in other departments:

> I don't know what other departments are doing. We talked earlier about what Lean is doing within the health departments … I don't know what they are telling these people. If, for example, they decided to do Lean in the Library, I wouldn't know what they would do, so I don't know if there would be any value to that.

Investing in systems or people. Kevin talked about the trade-off that occurs if an organization chooses to invest more heavily in systems over people. He described this issue with a broad view of the results relating to efficiency:

> Because of Lean and all the things that go with it everybody is going back the other way now, cutting back, which is a good thing. But in order to cut back, you also have to reinvest and maybe expand in other areas. To save money on 'side a' you might have to spend money on 'side b' to get an overall saving, and the savings could turn out money-wise or efficiency-wise. You have to have a bigger, broader picture, but nobody is looking at that from my perspective.

Chris expressed his view that when organizations are faced with a choice of investing in systems or people, they should always choose to invest in people:

> Well, they are always trying to find new ways to do stuff. And to me it always comes down to who you hire. If you hire good people you will be fine; otherwise you get problems.

Unanticipated consequences. Kevin talked about unanticipated consequences he observed when improving the efficiency of his operation. Specifically, he felt there was a resultant inability to handle increased demand caused by efficiency:

> I did 1.4 million last year and my forecast for this year is 2 million. I know that if I were given this store with the proper procedures and everything, I would probably sell close to 4 million per year. So should I go out and promote the service? Well I don't, and if someone said to me, 'I don't want to order from your store', I would say 'fine' because I have enough to work on now.

Chris detailed his view that changes in one part of a system can have consequences on other parts of the system:

> I can't fathom, and I've thought about it a lot, Lean in the medical profession. How can you 'Lean' that? Do you have an extra surgeon? Do you move the surgical places closer to the recovery room? This is a very interesting point, because you don't know how changes in one part of the system will affect the other parts of the system.

Unit leaders viewed leadership practices in similar ways to their senior leader counterparts. They were aware that their leadership stances or stated perspectives represented system enablers or detractors. They regarded effective communication and employee training as important project enablers and commented on the need to account for unanticipated consequences from improvement projects.

Chapter Summary

In this chapter, I presented the study's data. These data were based upon the categories and subcategories developed during my analysis of the study's interview transcripts. Data were presented in the order of the study's research questions, aligning with the study's conceptual framework. Data were presented categorically based upon the participant groups of senior and unit leaders.

Regarding the study's context and implementation, both senior and unit leaders expressed their views about the initiative in terms of how it addressed a *clear business need for improved efficiency*, how they *perceived learning and efficiency in context*.

Regarding the implications for individual learning, senior leaders discussed individual mastery in terms of the *leadership skills* they used to lead improvement projects and how they managed their *personal learning*. Unit leaders discussed individual mastery in terms of how it *affected professional practice* and their *personal learning*. Senior leader participants described mental models in terms of the *affective domain* of project participants and *industry best practices*. Unit leaders described mental models in terms of the *affective domain* of project participants and *using industry best practices*. Participants expressed these concepts in further detail through the study's subcategories, and these supporting aspects were presented in this chapter.

Regarding the implications for departmental (unit) level learning, senior leaders discussed shared vision in terms of how it was *established at project inception* or *established through mission*. Unit leaders discussed shared vision in terms of how it was *established at project inception* and how it was *established through mission*. In the category of *established at project inception*, unit leaders related how shared vision was

established through training. In the category of *established through mission*, unit leaders related how shared vision was established through the institution's *mission of efficiency* and *mission of safety*. Senior leader participants discussed team learning in terms of *managing tensions* and *project flow and definition*. Unit leaders discussed team learning in terms of *managing tensions* and *managing project flow and definition*. Participants expressed these concepts in further detail through the study's subcategories, and these supporting aspects were presented in this chapter.

Regarding organizational learning, senior and unit leader participants discussed systems thinking in terms of *system enablers* and *system stressors*. Participants expressed these concepts in further detail through the study's subcategories, and these supporting aspects were presented in this chapter.

CHAPTER FIVE: CONCLUSIONS, DISCUSSION AND IMPLICATIONS

Introduction

Higher education institutions continue to seek enhancements to organizational efficiency as a means of satisfying widening stakeholder expectations. The drive for efficiency is rationalized via images of an economic climate where publicly available funds are increasingly scarce and under competition with other public services, such as healthcare. A neoliberal sense of limiting government support for higher education promotes efficiency as the means of securing financial resources for institutions. Despite efforts to reconcile costs and rationalize academic programming and services, many higher educational institutions find themselves in an unstable financial situation as they plan for the future (Association of Universities and Colleges in Canada, 2012).

Organizational efficiency has been examined in a variety of educational settings. Data-driven approaches to this examination (e.g., Taylorism) have been supplemented by broader management techniques from the engineering and manufacturing sectors, such as quality assurance methods, the development of organizational learning and the systems view of the organization (Garvin, 1993; Roberts & Tennant, 2003). These systems-based approaches to efficiency and organizational learning have become prominent in higher education through the introduction of institutional improvement initiatives involving Lean methodology (Balzer, 2010; Finn & Geraci, 2012; Radnor & Bucci, 2011).

When planning this study, I noticed the parallels of systems-based reasoning in the literature regarding organizational learning, efficiency and implementations of Lean in higher education. An examination of key publications involving a systems focus in

each of these areas led to the development of this study's conceptual framework, as described in chapter two.

In this final chapter, I present the study's overview, an examination of its themes, and conclusions and a discussion of results. The implications of the study for practice and policy, theory and further inquiry are presented, as well as a brief chapter summary.

Study Overview

In this case study, I examined the perceptions of employees engaged in a series of improvement initiatives at a Western Canadian university from September 2011 through September 2013. Participants were senior leaders (four in number, with oversight of budget and employees across multiple departments: typically a director role) or unit leaders (three in number, with departmental responsibility for budgets and employee supervision: typically a manager role). Improvement initiatives were intended to enhance departmental processes or improve inventory practices. Participants generally reported efficiency gains and better service provision as a result of these improvement projects.

All of the improvement initiatives used Lean as an improvement methodology. The university provided related training and consultation services to prepare employees to engage in improvement projects. There was no central office concerned with promoting or supporting Lean; however, personnel and resources were made available within the Office of the Vice-President, Administration to aid project selection and provide training services regarding Lean. Certification opportunities were available for employees who participated in the improvement projects.

Based upon the perceptions of unit/departmental leaders, the study's research questions were:

1. How did participants perceive the context and implementation of an efficiency (Lean) initiative at one university site?
2. What were the implications of these efficiency initiatives for organizational learning at the individual (micro) level?
3. What were the implications of these efficiency initiatives for organizational learning at the departmental or unit (meso) level?
4. What were the implications of these efficiency initiatives for organizational learning at the institutional (macro) level?

Data were collected during 2014 over two phases of semi-structured interviews. The first interview phase was intended to elicit information related to context of projects and participant perceptions of learning at each organizational level. The second interview phase allowed participants to elaborate on their initial commentaries and discuss future improvement possibilities for departments and for the university as a whole.

Data were coded and analyzed using Saldana's (2013) codes-to-theory framework. In the previous chapter, I presented the study's categories and subcategories that emerged during the first cycle of data analysis. To generate the study's themes and conclusions, I used second cycle coding to identify patterns within the study's categories and subcategories. Second cycle coding is a means of developing "the study's categorical, thematic, conceptual, and/or theoretical organization" (Saldana, 2013, p.207). I achieved this through further analysis of the NVIVO dataset and further review of interview transcripts. I also used document analysis to support findings.

In the remainder of this chapter, I present the study's themes and conclusions, the study's implications and recommendations for further study.

Themes That Emerged from the Study's Findings

I recognize that in any study only a limited number of themes can be presented and that themes must support the study's conclusions. A different researcher may have pursued different lines of inquiry and analysis, or developed a slightly different conceptual framework; however, I believe the following themes best represented the experiences related by study participants:

1. Effective communication promoted learning and enhanced efficiency;
2. Conceptions of organizational learning focused predominantly on the unit;
3. Efficiency methodology was superordinate to efficiency method;
4. Learning was conceptualized as an essential project resource.

Effective Communication Promoted Learning and Enhanced Efficiency

All study participants emphasized the importance of effective communication at the individual (micro), unit/departmental (meso) and organizational (macro) levels when planning and executing improvement initiatives and projects. Effective communication practices typically focused on establishing a sense of organizational importance; sharing the results of these improvements across the organization and helping staff members learn key concepts related to improvement. The use of effective communication was, by far, the most common leadership competency discussed by participants during interviews.

Participants' descriptions of communication echoed aspects of the study's conceptual framework. In terms of *personal mastery*, participants reported communication as a core leadership competency that promoted two main goals relating to efficiency improvement:

1. *The use of effective communication to clearly articulate improvement project goals*. Participants typically described communication as requiring an emphasis on listening and speaking when working with teams. Given the collaborative nature of improvement projects, one-way "command-based" communication was not encouraged by participants as a means of promoting project success.
2. *The use of communication to promote a positive learning environment for improvement project participants*. Staff members who were engaging in improvement projects required significant upfront learning. Participants reported that clear, open communications allowed project participants to maximize their personal learning potential to pursue learning objectives without a fear of being compromised by cultural or operational issues in the workplace.

With respect to *mental models*, participants expressed their views about communication based upon how it influenced the affective domain of employees and described communication as an industry best practice. Senior leaders described how effective communication enhanced employee motivation and ensured a sense of momentum during institutional improvement projects. Unit leaders talked about the importance of employee intuition, and how frequent communication with staff members would help them better understand intuitions. By respecting employee intuition, they could more easily identify areas of improvement for prioritization. Unit leaders conceptualized effective communication as a means of encouraging a participatory project approach, enhancing a sense of focus on the customer and developing project standards and measurements.

All study participants described how collaboratively developing a *shared vision* benefitted improvement projects. They also described how effective communication could be used to ensure the persistence of improvement results in the workplace after project completion. Participants felt it was important, where possible, to communicate a shared vision in terms of existing institutional or departmental missions, including any special workplace considerations (such as ongoing safety initiatives).

With respect to *team learning*, participants stated that the use of effective communication could reduce tensions that may emerge during group learning exercises. Senior leader participants talked about how effective communication created a sense of empowerment at the individual level and decreased tensions between individual and group goal attainment. Both senior and unit leaders described how effective communication encouraged healthy team dynamics throughout the course of improvement projects. All participants placed an additional emphasis on explaining the "why" of improvement projects to encourage deeper team learning experiences and allow employees to act in freer ways when contemplating process improvement.

Regarding *systems thinking*, study participants expressed a view that communication was the most holistically useful management tool at their disposal when managing improvement initiatives. Even though improvements were generally reported as useful for the department or the institution, when viewed as a system, some project complexity and resulting unintended project consequences were noted. Transactions that involved effective communication were described as a mitigating factor, or a form of early warning system, to deal with such system issues.

Study participants described factors that either enabled a systems-based approach or restricted it. Senior leaders reported the use of collaboration, communication, centralization and organizational memory as system enablers while change fatigue and employee fear were considered to be system stressors. Unit leaders described the use of consistent policy and practice and effective communications as system enablers while a lack of investment in systems or people, along with not properly dealing with unanticipated consequences of change, to be system stressors.

Study participants discussed aspects of effective communication broadly in terms of how they managed people and how they managed their departments. Both senior and unit leaders felt that the development of individual learning capacity was an antecedent to the development of organizational learning; therefore, this natural pairing of continuous improvement with continuous learning was important. They also described why it was important that individual staff members were aware of their individual importance to efficiency improvement initiatives. This was highlighted by the nature of the small groups that were used to seek improvement; single voices are heard more loudly in small group settings.

Conceptions of Organizational Learning Focused Predominantly on the Unit

When analyzing data, it is useful to consider what participants said as well as what they did not say. Over two phases of participant interviews, I noticed that it was rare for participants to talk about their institution's objectives or strategy or its future direction. Participants rarely mentioned the university by name during interviews. I also noticed that participants were frequently reticent (or at least hesitant) when describing their personal learning experiences during improvement initiatives.

With a diminished emphasis on the individual (micro) and institutional (macro) levels of organizational learning, it was my observation that the majority of participant responses related to unit or departmental (meso) learning experiences. After reflecting upon the time I spent with participants and my review of the study's data, I offer the following possible explanations regarding this apparent categorical focus.

With respect to individual (micro) learning experiences, participants sometimes described improvement experiences in terms of prior efficiency experiences. I believe that many of the required skills and knowledge they previously acquired were directly transferable to the new improvement initiatives. It is worth noting here that participants were typically long-term employees, with terms of service to the university in the 15-25 year range. Participants who were familiar with previously used improvement methodologies, such as Total Quality Management (TQM), were able to learn new methodologies more easily. Many study participants came from technical or science backgrounds and may have found the improvement methodologies to be more familiar based upon that preparation.

When participants described their own learning, they more commonly described how they developed their leadership competencies regarding the conducting of improvement projects rather than how they pursued their learning regarding Lean methodology. Senior leaders and unit leaders held divergent views about these leadership competencies. Senior leaders emphasized change management and communication skills when working with groups, but personally focused on learning more about their own workplace and how it functioned at the employee level. Unit leaders emphasized how they affected the professional practice of staff members directly and indirectly and the

workplace culture while personally focusing on specific learning that related to Lean methodology itself.

With respect to organizational (macro) learning, I believe that participants typically focused on the needs of their own departments because they did not need to consider wider institutional goals and priorities in order to seek local improvements. The research site did not feature an organization-wide learning plan regarding improvement methodologies and did not have an office dedicated to providing centralized support for improvement projects. University documents did not contain information about Lean as an improvement methodology even though over 40 Lean projects were completed during the time of the study and further Lean initiatives were planned or underway at the time of the completion of this study. It is possible that such alignments were present in the planning or execution of improvement initiatives, but were not visible in the data.

Finally, it is possible that many of the ideas presented by participants spanned multiple organizational learning levels in the study's conceptual framework and associated research questions. During my data analysis, I noticed that some overlapping categories and subcategories emerged from the study's research questions. With respect to the study's first research question (regarding context and system inputs), I expected overlap due to the general nature of the question. However, based upon the study's conceptual framework, I did not anticipate thematic overlap between the three research questions regarding individual (micro), departmental (meso) and organization-level (macro) learning.

I found the existence of thematic overlaps between organizational learning levels in the study's data to be an interesting finding. When one considers the cloudy debates or

thematic divergence that exist with thinking and conceptualizations of organizational learning and the inextricability of certain concepts that interrelate under a systems model, it is perhaps unsurprising such thematic overlaps were present.

Efficiency Methodology was Superordinate to Efficiency Methods

There were marked differences in how participants talked about Lean and how it was referenced in the literature. I believe that this was due to differences between Lean methodology and Lean methods (tools) and the natural confusion that is introduced upon consideration of these concepts. Lean methodology refers to the reduction of waste and respect for the workforce as it was originally conceived in the Toyota Production System (Bowen & Spear, 1999; Liker, 2004) or, alternately stated, its philosophical basis. Lean methods (tools), by contrast, number in the hundreds (George, Rowlands, Price, & Maxey, 2005), including 5S, fishbone diagrams and Kaizen exercises.

Study participants presented a view that improvement projects would have been effective in their workplace no matter what efficiency improvement method was used. However, participants presented a view that the introduction of formal improvement projects, along with their dedicated resources and a project manager (and therefore an officially stated institutional importance) were critical to efficiency improvements. In other words, participants said that the use of Lean methods themselves, while useful, were not the key contributors to the success of improvement projects. The support for formal efficiency improvement projects, with adequate, dedicated resources, was considered the most important contributor to successful improvement projects.

Some participants, however, spoke favourably about strengths of the Lean approach in comparison with previous improvement approaches they had used, such as

Total Quality Management (TQM) and quality circles. Improvement projects examined during this study involved the management of physical resources (such as inventory) or the improvement of processes (such as managing student applications for admission). Participants generally reported positive results from the use of Lean tools such as 5S (to help sort out inventory issues) or the use of fishbone diagrams (to better visualize processes and determine steps that could be eliminated to improve efficiency).

Participants clearly stated that alternative tools or approaches could have been used to realize similar results. They noted that instantiating a project with defined goals and personnel resources carried an institutional imprimatur and an assurance that project objectives would not simply be assigned as an "add on" to someone's existing workload; or worse, never completed. One participant expressed a view that a combination of common sense and a reliance on employee intuition would pay equivalent dividends to the use of Lean methodology or methods when pursuing improvement.

All participants noted that a positive workplace culture that encouraged innovation was an essential co-requisite to improvement. They described the advantages of improvement projects based upon a focus on collaboratively defining project goals and visions. Project teams were typically comprised of not more than seven people, including employees with decision-making authority and those with hands-on operational responsibility. Participants noted that the small size of teams encouraged efficient group decision making about key aspects of projects, adding a democratizing factor that allowed participants to feel their voices were heard without barriers to discussion between decision makers and employees. While participants viewed these aspects of

participation positively, they noted that there was nothing unique about these approaches in terms of the use of Lean methods.

It is perhaps little wonder that some confusion may arise in any workplace setting when the term "Lean" is used by itself: when using this term, does the speaker intend to talk about the methodology or methods? When Lean is referred to generally in the media or by government agencies, which approach are they referring to? It is worth considering whether commonly discussed concepts in any work setting (e.g., "efficiency", "profit", "results") suffer issues of ambiguity depending on the lived experience of participants and the extent to which these concepts are institutionally defined.

Learning Was Conceptualized as an Essential Project Resource

All study participants talked about how they managed and promoted individual and group learning as essential resources to improvement projects. Participants described how such learning could be individually or collectively fostered based upon effective management techniques or project planning, the nature of institutional culture and workforce changes regarding staffing levels or generational attitudes.

In terms of individual learning, participants described processes where individual learning tended to precede group learning; that is, basic learning about Lean was a requirement to propose and plan improvement projects while that same individual learning would then serve as a basis for collective learning in small groups when improvement projects were introduced. This description echoed Yang, Watkins and Marsick's (2004) model where personal learning precedes structural learning in terms of organizational learning flow.

Leaders talked about the learning experiences they noticed in each improvement project phase and how each could be viewed as a project outcome for the overall improvement efforts. In the systems view, participants tended to view improvement projects as consisting of three main phases:

1. An *instantiation phase*, marked by the assembly of teams and the input of required resources. In terms of managing learning, participants viewed the formal and informal learning experiences of employees to be system inputs.
2. An *engagement phase*, where most of the project work occurred. In terms of learning, this phase typically involved group learning experiences, and leaders managed this learning as a resource in terms of maintaining focus on the project goals and managing any resulting tensions from group learning experiences.
3. An *output phase*, where the results of the improvement project were assessed and structures were put in place to ensure the persistence of project results. In terms of managing learning as a resource, leaders discussed its importance in terms of maintaining a shared vision and a positive workplace culture. Issues of workforce management were described as important when considering how organizational memory would be preserved.

Participants talked about their views regarding future departmental challenges and proposed employee empowerment and mutually developed shared visions for efficiency in order to preserve a positive learning environment. When considering what types of projects had been successful in their departments, many participants talked about the difference between formal and informal projects and the place of each regarding improvement. They felt that formal projects enjoyed a greater chance of success due to

their formal recognition by leaders and the fact that they had dedicated resources assigned to them. Informal projects were proposed and completed at the individual employee level in order to preserve gains from previous improvement initiatives and incrementally improve services and practices.

Conclusions

In this section, I present two conclusions based upon the study's themes, categories and subcategories and a holistic analysis and synthesis of the study's supporting materials, memos and data. In my view, these conclusions most broadly represent the participants' voices and their descriptions of organizational efficiency and learning. The study's conclusions were:

1. Efficiency initiatives served as an impetus for organizational learning
2. Communication Emerged as the Most Important Factor to Ease System Limitations.

Efficiency Initiatives Served as an Impetus for Organizational Learning

With respect to enhancing organizational efficiency, the development of an engaged, communicative and expertly trained workforce that is skilled in learning individually and collectively can be the primary force behind realizing institutional improvement. This workforce, comprised jointly of university or college faculty members and employees, can work together in lockstep to constantly improve operations for the benefit of all stakeholders; however, the primary beneficiaries of these efficiency improvements will typically be an institution's students.

It would be possible to develop new initiatives regarding institutional efficiency improvements by planning and developing organizational learning capacity at the

individual, departmental and organizational levels. Just as time and money serve as the typical inputs to projects, learning itself could be used as a primary input the resource new initiatives. A broader reconceptualization of how universities and colleges regard their human resources would be required in order to move in this direction.

In such a scenario, the value of building a longer-term employment relationship with both faculty and employees becomes apparent when one considers that the system output, organizational learning, also becomes the system input in an organization that trusts its constituent members to autonomously identify organizational shortcomings and work diligently to ensure efficient learning experiences and institutional operations for all institutional stakeholders. It is not a small irony that the expected output of a university or college (i.e., learning) should be its most valued input for improvement.

Communication Emerged as the Most Important Factor to Ease System Limitations

It has been argued elsewhere that the systems-based approach to organizational behaviour has endemic limitations. For example, Bolman and Deal (2008) reported that in the systems approach, organizational actors within distant parts of the system might not detect aspects of change occurring in a separate part of the same system. The result of such a disconnection would be a loss of shared vision and the potential of not responding to unanticipated consequences brought about through change initiatives.

The use of frequent, authentic and clear communication by leaders and employees at all levels of the organization is the only means by which the limitations of the system-based approach to efficiency can be offset. Study participants were clear in their remarks about the importance of communication: it was the leadership competency that they reported most frequently when discussing organizational learning and efficiency across

all people-related or structure-related matters and it represented the means by which system inputs and outputs could be most reasonably assessed and managed.

Study participants noted that there is a "cost" associated with developing and disseminating effective communication and that cost is principally measured in terms of time. Participants were unified in their view that supervisory duties and ongoing project and departmental responsibilities represented significant challenges in terms of personal time management and their employees faced similar issues. Despite the costs of communication, participants reported that the time investment paid significant dividends during improvement efforts in terms of establishing shared vision, maintaining morale and keeping improvement projects on track. This also allowed participants to detect problems or issues that might negatively affect projects.

Participants noted the role of organizational memory in the context of efficiency improvement initiatives. They described this in terms of system complexity. For example, participants from the trades noted that certain types of machinery were best serviced by people who had long-term familiarity with the equipment and related technical systems. Less senior staff members could perform similar tasks, but significant upfront time investments or consultations were required to be successful. Associated efficiency issues were discussed regarding clerical and administrative staff. Participants talked about the negative organizational impact of staff reductions among long service employees in terms of loss of organizational memory.

Discussion of the Study's Themes and Conclusions

In this section, I discuss the study's themes and conclusions as they relate to the study's conceptual framework. This is presented through comparisons between the

study's findings and related publications regarding organizational learning, efficiency and the use of Lean in higher education.

Organizational Learning and Efficiency Revisited

As noted in chapter two, and throughout this dissertation, there has been a lengthy (and perhaps not-so-useful) debate regarding how organizational learning has been defined, conceptualized and assessed. When considering a wide span of concepts regarding a topic area, benefits are realized from an examination of logical groupings relating to these concepts. By presenting organizational learning typologies alongside the study's findings, a discussion of the study's themes and conclusions is eased.

Ortenblad (2002) suggested a four-stage typology by which the various publications regarding organizational learning could be sorted. He proposed that publications about *organizational learning* (or *old organizational learning*) related primarily to basic concepts, such as organizational memory, differences between individual and group learning (e.g., Hedberg, 1981; Kim, 1993) and how concepts such as double-loop learning (e.g., Argyris & Schon, 1978) might exist within organizations. *Learning at work* categorized publications that addressed the use of gained knowledge or training in the workplace, necessarily intertwined with daily work activities (e.g., Watkins & Marsick, 1993). *Learning climate* publications considered the organization an entity that should promote a positive, social learning culture (e.g., Brown & Duguid, 1991; Wenger, 2008) where learning and information flows freely around the organization (Garratt, 1990). Finally, publications speaking to *learning structure* are concerned with structural aspects of organization that encourage or discourage learning. Such structures could feature systems that capture and share learning (Watkins &

Marsick, 1993). Publications regarding the systems approach to organizational learning (Senge, 1990; Yang, Watkins & Marsick, 1993) fit in this final typology category.

If the study's themes and conclusions are compared with the *organizational learning* type, the focus becomes how organizational learning itself should be defined or whether or not the concept is definable. It was my experience during this study that, just as defining learning itself was not an issue that participants addressed, the idea of further defining organizational learning here is not necessarily productive to advancing the discussion relating to efficiency improvement. Some literature summaries regarding organizational learning (e.g., Barker Scott, 2011) drew upon comparisons with human learning to provide alternative definitions, but given my sense of the tenor of the inquiry at hand I felt this was unnecessary to pursue as a theme.

By contrast, the *learning at work* type was highly related to this study's data, themes and conclusions. With an enhanced focus on leadership factors regarding the departmental (meso) level of the organization versus aspects of individual and organizational learning, study participants seemed acutely aware of the learning and developmental requirements of their staff members. It was my perception that study participants tended to draw from Yang, Watkins & Marsick's (2004) associated concepts of the structural level when articulating and operationalizing organizational learning in the workplace. These authors originally stated these concepts as *connecting the organization to its environment*, *establishing systems to capture and share learning* and *providing strategic leadership for learning*.

Concepts regarding the *learning climate* were relevant to the inquiry at hand. With respect to climate, the comments and resultant discussion themes offered by study

participants pointed toward a "social life of information" (Brown & Duguid, 1991); however, in this study, that social life for learning was typically limited to the departmental/unit (meso) organizational level. However it was my sense, based upon the study data and my interactions with participants, that participants would have been willing to share their experiences in group settings or communities of practices with the goal of further professional development. Some study participants commented that they believed social learning in their workplace has diminished over the time of their careers, noting that in the past they spent more time with colleagues of all backgrounds and university administrators tended to do the same.

With respect to *learning structure*, the systems approach to learning was not distant from conceptualizations of study participants. It is, however, reasonable to question whether or not the systems approach to organizational learning is the most appropriate model, despite its prominence. For example, the systems view could be viewed as the "easy way out", declaring, "everything to be a systems based model" in order to account for organizational complexity or the unknowns that exist within organizations. Supporting this notion, Sterman (2002) argued that the systems approach to organizational learning was appropriate, not because it was the right model, but because all other models were wrong. The proposition of systems might also be viewed as an unduly positivist model: Senge acknowledged that its roots were in the engineering sciences and was partly based upon his graduate work at MIT (Forrester & Senge, 1980).

While reviewing the organizational learning theory, I noticed that many authors focused on issues of organizational effectiveness rather than organizational efficiency. Organizational effectiveness and efficiency are of course related concepts; however, it

would seem that if researchers or university and college planners wished to consider learning as a means by which efficiency initiatives could be planned and managed, the underlying constituent concepts of efficiency versus effectiveness should defined and prioritized. Study participants described departmental and organizational goals differently in terms of efficiency and effectiveness, and therefore some resulting confusion could emerge regarding how to measure improvements.

There are a number of ways to associate the study's first conclusion and organizational learning concepts. From a leadership perspective, the notions of effective planning, communication and an attention to the learning resource needs of the organization are clear. deGeus (1997) regarded organizational learning equivalent to organizational planning. Fiol and Lyles (1985) noted that learning represents organizational adaptation to change, and the responses to change can be viewed through changes to the systems of the organization, organizational states of knowledge or simply through the organization's actions. Bolman and Deal (2008) described tensions that exist in the learning organization; specifically, when differences existed between what individuals wished to learn and the learning requirements of the organization. All of these authors presaged, to some extent, the organizational themes and conclusions of this study, envisioning learning as a holistic and particularistic phenomenon that drives the inputs and outputs of efficiency efforts while addressing shortcomings of the systems model.

It is possible to examine the systems approach to organizational learning via an alternate typology. Meyer (1982) proposed four separate systems that influenced organizational learning as follows: *strategy*, *structure*, *slack* and *ideology*.

With respect to *strategy*, study participants acknowledged that they gained knowledge about their organization's approach to efficiency based on their experiences working with centralized university staff or consultants. However, they tended to articulate that knowledge mainly in terms of operations at the department (meso) level. In my view, this was not because participants were disinterested in institutional strategy; rather, it was more likely due to the fact that the organization itself did not articulate a common vision toward the improvement of efficiency or the use of Lean as a means of satisfying organizational objectives. Participants noted a senior university executive "void" that existed with respect to institutional communications regarding efficiency improvement and the use of Lean methodology. The literature regarding Lean implementations in higher education uniformly described the importance of early and continued executive support for improvement initiatives within academic institutions.

With respect to *structure*, participants in this study acknowledged that, due to the nature of their positions and their focus on departmental level goals, there was not typically a need to interact with the wider administrative structure of the institution to plan or improve efficiency operations within their departments. Outside of receiving capital and operating funds from the larger institution, and occasionally working with centrally supplied consultants or personnel about Lean initiatives, they were able to plan and implement efficiency improvements autonomously. Participants expressed a view that more communication between their department and the institutional level of the organization would have aided their improvement efforts.

The concept of *slack* was not evident in the study's data, themes or conclusions. Slack represents how much available time employees have to apply to priorities as

identified by themselves or by their departmental leaders. Part of the aspect of efficiency improvement that I noted in this study was the fact that, despite advances that were reported by study participants, it was not the case that specific improvement metrics were typically in place or applied to planning work. Theoretically, it would be interesting to consider the relationship between slack and institutional culture. For example, what does it feel like to work in an environment where there is no definable slack? Are institutional efficiency initiatives geared to reducing slack to zero? What would the implications be of such directives for workplace planning and culture?

Finally, in terms of *ideology* it was the opinion of study participants that a philosophical "void" existed in their institution regarding process improvement and organizational learning from an executive leadership perspective. However, participants' views about how processes could and should be improved included statements that they would have benefitted individually and departmentally from the expression of such viewpoints from the most senior members of the organization or its board. Publications regarding organizational learning and the use of Lean in higher education clearly state the importance of executive leadership and communication as it relates to the development of the learning organization and fostering a culture of improvement.

In this study's literature review, notions of efficiency (and related concepts, such as quality) were reviewed beginning with the works of Weber and Taylor and leading up to more contemporary definitions and concepts influenced from engineering and manufacturing environments. Regarding the more recent conceptualizations of efficiency that were influenced from systems thinking and quality improvement methodologies, it is possible to compare them with organizational learning typologies.

When organizational learning is viewed from Ortenblad's (2002) perspective of *learning structure*, parallels can be drawn between it and the systems-based efficiency thinking. For example, efficiency publications regarding quality assurance methodologies frequently refer to systems, such as Six Sigma or Lean (George, 2002). Six Sigma represents a cyclical systems approach to quality, known as "DMAIC", that advises quality assurance professionals to *define*, *measure*, *analyze*, *improve* and *control* aspects of production when seeking advances in quality (George, 2002). It would be of interest to deign the scope and scale of such cycles that are emerging in institutional planning; for example, when assessing whether or not efficiency has been improved should we measure it quarterly or in cycles involving years of analysis? Does a measurement cycle even exist within some institutional improvement initiatives?

Similarly, there exist organizational learning publications that speak to concepts, tools and/or measurements that are influenced by efficiency tools. For example, Kim (1993) detailed an approach to organizational learning referred to as the OADI cycle, the cyclical steps of which were *observing*, *assessing*, *designing* and *implementing*. In his paper, he acknowledged that cyclical systems were Lewinian in nature (paralleling the general scientific method) and while they were typically useful for capturing the main learning activities of an organization, they were insufficient to capture enough detail to represent an organization's learning experience. Since the nature of learning starts with individuals, it is necessarily true that behaviourial aspects of learning and working together must be accommodated and greatly expanded system models may be required to represent organizational learning.

When the study's second conclusion is viewed from the systems perspective, efficiency literature compares the ratio of the cost of developing and conducting communications with the benefits of using such organizational communication methods. This echoes Stone's (2011) definition of efficiency as the "ratio of an organization's inputs to its outputs" (p. 61). Study participants clearly articulated their views that the use of frequent, authentic and accurate communication at all organizational levels paid high dividends during improvement projects. Efficient learning seems to be sound in principle, but efficiency of communication suggests interesting, and possibly unanticipated, effects. For example, when a university president efficiently contributes to social media, is that his or her authentic communication or disperse efforts of a communications department? Are the cycles of efficient communication shortening and, if so, what are the effects on university leadership and fostering of a meaningful work environment?

Revisiting Lean in Higher Education

Reports about how Lean has been implemented in higher education were presented in this study's literature review separated by their implementations at the institutional, departmental and individual levels. Reports about these experiences were typically pragmatic in nature, often presented as case studies with supporting evidence rather than representing propositions of theory. Nonetheless, comparing this study's conclusions with the recent experiences of comparator institutions regarding departmental/unit and organizational learning is useful.

Experiences at the institutional level. In this study, participants described the majority of their preparation for, and execution of, improvement projects at the unit or departmental level. Despite this meso organizational level focus, participant expressions

of desired institutional level actions were clear in the study's data, themes and conclusions, and these themes and conclusions were chiefly concerned with aspects of communication, the nature of systems, project methodology and how learning can serve as a useful improvement project input.

Study participants posed questions relating to how value can be commonly agreed upon during improvement projects, how services can enjoy a better institutional flow than existing services and directly map to the needs of stakeholders. Balzer (2010) presented a broad conceptualization of how Lean should be implemented at the institutional level as follows:

> Defining the value of the process from the perspective of beneficiaries, identifying process flow (from beneficiary and provider perspectives, to determine whether and how each step and activity in the process adds value), eliminating the many types of waste that add no value to the process, making the process flow smoothly, with activities or services 'pulled' as needed by the beneficiary rather than 'pushed' by the provider and pursuing perfection through a combination of continuous improvement and radical transformation of the process. (Balzer, 2010, p. 25)

The author described in detail the importance of learning in satisfying organizational objectives, noting a parallel in the experiences of long service employees at The Toyota Motor Company who found success by working so closely together on improvement they did not extensively document processes or even define improvement projects (Balzer, 2010). The author claimed that organizational learning conceptualized as a system carried

the benefits of organizational flow as expressed elsewhere in the literature about learning (e.g., Csikszentmihalyi, 1990).

Participants also expressed clear recommendations about how university and college administrative bodies might prioritize improvement efforts, and these aligned well with the literature about Lean in higher education. Clayton (1995) described critical success factors for organizational improvement that were defined by faculty and staff councils. Those councils defined quality by better understanding customer values, developing precise specifications for products and services, delivering products or services exactly to these specifications and improving the overall specifications while reducing costs to the customer. In Clayton's (1995) work, a university-wide education effort was launched, focused on awareness of quality and efficiency as well as knowledge provided about each of the various quality improvement tools.

Further supporting participants' ideas on commonly defining institutional priorities for improvement, Comm and Mathaisel (2000) described a benchmarking framework that could be used by public sector institutions to pursue improvement by surveying the an organization's clients and/or stakeholders to determine priority areas. Flummerfelt and Banachowski (2011) proposed similar solutions that would identify priority areas for improvement (referred to as paradigms of concern) by polling the opinions of institutional administrators. The authors concluded that organizational learning could be useful to enhance the abilities of administrators and institutional staff concerned with the oversight of improvement projects.

The notion of organizational culture, and its effect of decision-making, was described by participants as both an enabler and a detractor for change. Langer (2011)

found that the collegial nature of university management could restrict active, ambitious leadership regarding change initiatives. He also concluded that the conceptual frameworks upon which improvement initiatives are based in higher education are less sophisticated than those in manufacturing settings. This conclusion about the nature of improvement projects supports this study's theme that the use of structured improvement projects was important; and that the use of any one prescribed method (e.g., Lean) was of lesser comparative importance to a project's methodology.

Participants described different ways in which improvement project priority could be established as well as resultant system interactions across the organization. Hines and Lethbridge (2008) advocated a data-driven means of institutional improvement, describing approaches that sought opinions from within an institution and within peer institutions. They used the metaphor of an iceberg to represent improvement projects: above water, the processes, technology, tools and techniques of improvement were apparent while the greater mass below the water represented the enabling methodologies of improvement, such as strategy, leadership and engagement. They reported that for wide-scale improvement projects to be successful, a high level of engagement was required among faculty and staff and effective communication would represent the means by which this engagement would be achieved.

It is possible to contemplate a vernacular to describe different types of efficiency initiatives. Sinha and Mishra (2013) proposed that for improvement initiatives to be viable, a necessary predecessor was establishing categories of efficiency in order to better define what types of improvement were most desirable. The authors articulated a position that institutional improvement must account for how people do their work, how people

tend to connect and how processes operate. Effective communication does not merely enhance the understandings relating to people and systems; it also ensures that the long-term strategy of improvement is followed, whereby improvements are linked to the longer-term goals of the institution.

Study participants described organizational learning as a phenomenon that should be viewed both holistically and through its component technologies. Antony, Krishan, Cullen and Kumar (2011) suggested a consideration of critical success factors as a means of enhancing the success of continuous improvement projects at universities. They described these as: uncompromising top-management support and commitment, effective communication at all levels vertically and horizontally, strategic and visionary leadership, developing organizational readiness/institutional resources and skills, prioritizing projects and considering organizational culture. The authors also identified which specific Lean and Six Sigma tools they believed would be best suited to the higher education sector.

These publications regarding the use of Lean in higher education, viewed from an organizational perspective, featured a variety of themes that echo human resource and engineering-based approaches to university management. Supporting the human resource approach, Balzer (2010) claimed the experiences of long-service employees were improvement enablers from a learning perspective, while Clayton (1995) encouraged high engagement and awareness among employee groups. Supporting an engineering approach, Comm and Mathaisel (2000) described a benchmarking framework informed by university administrators as an improvement enabler while Langer (2011) described the issue of institutional collegiality as a possible limitation to improvement.

These publications and reports regarding institutional implementations of Lean supported many of this study's themes and conclusions. In particular, the need for effective communication throughout an institution regarding improvement, beginning at the executive level, was a commonly expressed notion. Another common theme (but not prominent in the current study) was the use of measurement frameworks to assess institutional improvement or learning. Some study participants expressed an opinion that their university would have benefitted from defining areas of improvement and their related measures in a way that would be visible to stakeholders.

Experiences at the departmental level. Participants were clear about their assertions that organizational memory and knowledge transfer were key enablers to ensuring successful efficiency initiatives. Doman (2011) presented a case study involving departmental-level improvements to a grade-entering process led by a group of students. The author reported that efficient learning by the students greatly aided the development of the required changes. A transfer of that learning occurred when departmental administrative staff members later adopted the process. The author reported that the effective use of communication eased the overall process, as the effective documentation of processes was used to ease the transfer of knowledge.

Study participants noted that they would have liked to see university executives clearly articulate their support for improvement through Lean methods. Finn & Geraci (2012) noted that institutional executives most commonly instantiated improvement projects and typically hired external consultants to support that work. The authors reported that the use of project teams comprised of affected staff were effective when seeking departmental level changes. Staff members mapped the existing state of

processes while identifying problem areas, mapped the future state and created an implementation plan to enact changes and later assess progress.

Study participants desired a systems approach to conducting efficiency improvement as well as prioritizing improvements. Moore, Nash & Henderson (2007) described an institution's drive for improvement that was based upon employee satisfaction and support for organizational learning. Specifically, the plan was intended to foster a culture where improvement was seen as a core aspect of work and the same plan was used to identify areas of improvement most pressing to the institution. Their improvement efforts followed a four-stage process: identifying opportunities, designing solutions, implementing a culture of continuous improvement and preserving that culture. The institution used metrics to determine the effectiveness of improvement initiatives.

Paris (2007) studied the experiences of multiple institutions in North America relating to the use of Lean for improvement initiatives. The author reported that a wide variety of governance and administrative structures were used to promote and manage improvement, including how learning and/or communication efforts were introduced and managed. Institutions typically reported that the early and active involvement of senior executives in improvement efforts was very important to promote success. Additionally, linkages to the strategic plan or vision, the use of cross-functional and inclusive approaches, aligning with the values and culture of higher education and alignment with accreditation initiatives were deemed highly important.

In terms of shared vision, study participants were interested in understanding the "why" behind proposed efficiency improvements. Radnor & Bucci (2011) produced a report on the experiences of UK business schools involved with process improvement

initiatives. The authors reported that schools were, "creating an understanding of the need to change, revising processes and practices which had been untouched for years and engaging staff to enable them to challenge and question their working practices" (Radnor & Bucci, 2011, p. 9). They also reported that communication efforts from senior executives were effective when communications involved describing how improvement gains were linked to overall institutional strategy. Employees saw the benefits of learning in terms of developing their own professional practice over a longer period of time and becoming more engaged with their work when processes were improved.

Roberts and Tennant (2003) examined the experiences of a single UK business school regarding the use of improvement methodologies. In that study, the authors described how a Lean process was used to promote creative approaches to individual and group learning as well as problem solving. The authors concluded that, based on the experiences of the institutional quality and reliability team, they were effective in creating a new vision, determining new goals, reviewing processes and agreeing on milestones. The institution later reviewed the nature and impact of the changes and measured them against milestones.

These experiences regarding the use of Lean in higher education that were viewed from a departmental/unit perspective contained findings similar to this study's themes and conclusions. Radnor and Bucci (2011) described the importance of employee engagement and effective communications during improvement initiatives. Finn and Geraci (2012) acknowledged that improvement initiatives are often driven from an organization's executive level and therefore related communications from that group are important. Both the human resource and engineering based approaches were present in

these reports; Moore, Nash and Henderson (2007) described improvement in terms of employee satisfaction, while, in sharp contrast, Paris (2007) described the importance of strong governance and a mapping of activity to defined improvement metrics.

Implications

The implications of the study's themes and conclusions for practice, policy and theory are presented in this section. A reconceptualization of the study's conceptual framework is presented based upon an examination of the study's themes and conclusions, discussion and reflective activity regarding previously reported experiences with organizational learning, efficiency and Lean in higher education.

Implications for Practice and Policy

Since the use of effective communication at the executive, managerial and staff levels was stated as an important leadership competency and success factor, it is a natural implication that those who plan and/or engage in efficiency improvement projects should communicate clearly and often about the nature of organizational improvement and how it relates to an institution's mission and values. Aside from the managerial and leadership expertise required for effective communication, institutional culture should be considered and developed to ensure that employees feel that their opinions and contributions to the institutional mission are valued. In the case of institutional improvement, it is important that information is shared openly and freely regarding the things the institution does well and areas where it needs to improve.

A common usage of terms regarding the nature of improvement and associated improvement projects is important when communicating to stakeholders. If Lean is to be used as a project framework for efficiency improvement, it will be important that project

participants are not confused or distracted by the use of some of Lean's Japanese terms (e.g., Kaizen or muda). It is quite possible to engage in improvement by simplifying the means of efficiency improvement to satisfy the task at hand and tailoring the tasks to the learning capacities of project participants. Langer (2011) reported that simplified improvement frameworks were often employed within higher education environments.

If it is the case that effective process and structural improvements can be attained with methodologies other than Lean, then perhaps alternative approaches should be pursued for improvement projects or initiatives in higher education. Lean is a very specialized methodology that may not suit all institutional settings and has a high price of entry in terms of providing training to employees. That price of entry increases when certified consultants are retained to start up or lead institutional improvement projects, as they are not plentiful in number or readily available outside of major metropolitan areas.

Participants in this study seldom talked about their own institution or its goals or mission or how they personally tended to learn things prior to or during efficiency improvement projects. Rather than considering this to be a limiting factor, those who plan or engage in efficiency improvement initiatives should see the potential advantages of solidifying a shared vision for improvement through establishing clear linkages with an institution's mission and goals and providing enhanced support for the nature of professional development and learning for project participants and leaders. Paths to professional certification or the laddering of credentials from project management or certification may be viewed as attractive (as was done at this research site).

If the overriding factor for the improvement of efficiency is the use of structured projects with dedicated resources, then these must be provided either locally to

departments or provided centrally through a project management office (PMO). The success factors of projects can then be defined and results later measured.

In addition to considering the number of full-time employees that are dedicated to improvement projects, a consideration must be made for longer-term organizational learning. This means long service employees must be valued, with all of the benefits and costs that will entail. In comparison, Lean implementations in the Japanese automotive sector involved a grand bargain with unions. Improvements to efficiency were sought, but as part of the bargain, the employee headcount was not significantly reduced and remaining employees were guaranteed lifelong employment. It was this trust-based employment relationship that enabled Lean to be successful. Employers who pursue similar efficiency methodologies without a trust-based relationship are attempting to recreate industrial successes without requiring the same system inputs.

Many study participants expressed a view that it seemed unusual that despite the number of local or departmental initiatives relating to Lean and/or efficiency improvements, no official communication has occurred throughout the period of the study from senior administration (president or vice-presidents) or the university's board. Participants clearly expressed a view that executive-level communication about the importance and potential gains from seeking efficiency would have helped them in their own efforts to instantiate improvement projects, giving a connection to institutional messaging, momentum for change and further legitimizing the use of institutional resources to improve efficiency. Confirming some of these sentiments, Francis (2014) described how preparing for Lean improvement initiatives required considerations of

executive leadership, training and development, knowledge management, information technology and project governance.

In this study, the institution name and identifying features were anonymous beyond the institution's identification as a Western Canadian university. This decision was not made lightly, and I planned the study in this manner for a number of reasons. I anticipated that some workplace fear and/or tension existed within the institution; I found this to be true, as evidenced in the study's data. I found this to be unfortunate; in my professional and academic experiences I have found cultures of fear to be great disincentives to progressive organizational change.

Different approaches to efficiency and starting points for institutional improvement may be useful in future practice. For example, Cooperrider and Srivastva (1987) described the use of appreciative inquiry within organizations to bring about change. In simple terms, these authors claimed that it might be a better starting point for organizations to build upon what they are doing well rather than rue their shortcomings. In their view, appreciative inquiry represented the building of further successes from past successes while its opposite, deficit-based thinking, represented a focus on what an organization is not able to do.

In order to elaborate this concept, I present brief semi-fictional scenarios by which the communication about institutional directives can take when considering the place of efficiency within an institution. Under a deficit-based means of conceiving efficiency, directives from boards or executive levels of a university or college would appear as follows:

> Due to reduced funding levels from our provincial funding partners, we are launching efficiency initiatives targeted at reducing our net expenditures by 10 million dollars over the next five years. We will be taking an across the board look at all operations in order to find where we can maximize cost savings regarding procurement, the support for staff salaries and all related expenditures.

An appreciative approach to efficiency improvement would appear as follows as directives from boards or executive levels of a university or college:

> We recognize that funding for our operations is historically tenuous, but we are confident that we have invested well in whom we have hired to teach, conduct research and do the work required by our institution. We will continue to support organizational learning as the primary means by which our engaged workforce will identify areas where we can do better and build upon previous successes to promote the best learning experiences possible while satisfying our stakeholders.

Rather than presenting a utopian view about how efficiency initiatives could be conceived, this semi-fictional example aims to present an optimistic but emblematic example of how to begin new organizational discussions about efficiency. Study participants expressed optimistic views of the future where meaningful work and the development of a positive work culture encouraged efficiency goals.

Implications for Theory

Based upon this study's four themes and two conclusions, a reexamination of the related literature and reflection on the study's conceptual framework, I offer the following possible updates to that conceptual framework.

The study's themes and conclusions point out a number of useful theoretical considerations regarding organizational learning, efficiency and the conceptualization of organizations from a systems point of view. Participants clearly described effective communications as the main enabler of success during efficiency initiatives and an enabler that would countermand problems endemic to a systems view. While efficiency methods were effective as described by study participants, overriding philosophical considerations and the existence of dedicated project and learning resources were judged to be more important. Overall, the introduction of efficiency initiatives certainly had deep implications for organizational learning.

A number of changes could be made to the study's conceptual framework to account for these theoretical notions. For example, that framework can be revisited to account for the fact that organizational learning should not only be considered a system output, but one that necessarily feeds back on itself as an equivalent system input. This can be viewed diagrammatically as follows:

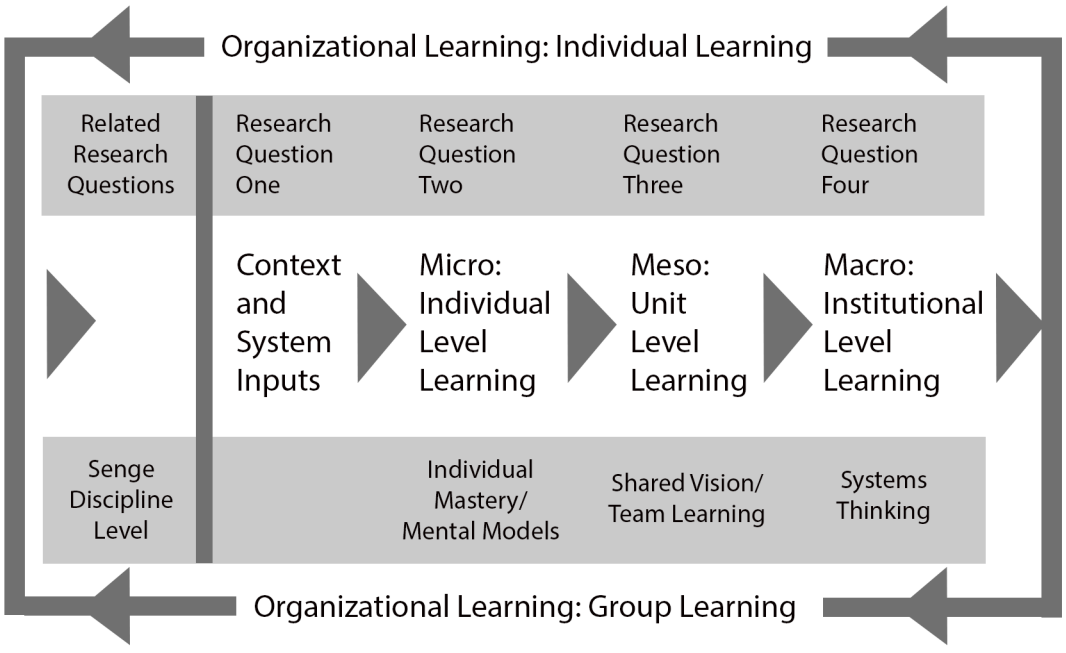

Figure 5.1. Updated conceptual framework with feedback loops.

Given that areas of inquiry regarding organizational learning have proposed double and even triple loop learning (e.g., Argyris & Schon, 1978; Argyris & Schon, 1996) these conceptual framework updates should present a familiar and intuitive feel.

Additionally, representations of people and structure can be added to that same conceptual framework from Yang, Watkins and Marsick's (2004) systems model and the themes and conclusion of this study. By augmenting the number of concepts that can be concurrently visualized in the framework, this can be represented as follows:

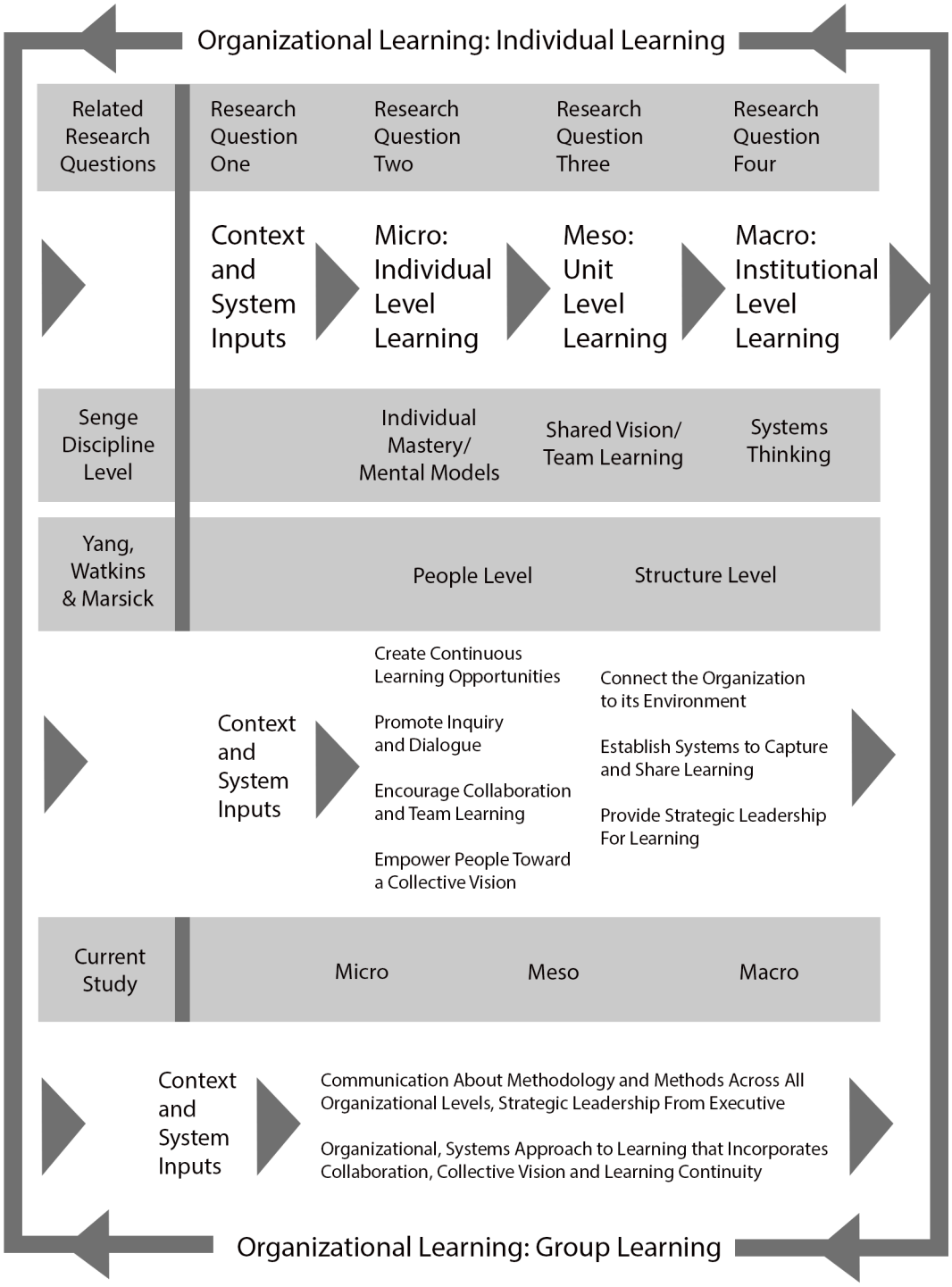

Figure 5.2. Updated conceptual framework with themes and conclusions.

This reconceptualization represents this study's themes and conclusions and adjusts the recommendations made for organizational learning presented by Yang,

Watkins and Marsick (2004). These authors considered organizational learning activities to be acted on separately within the people and structural levels of an organization. This reconceptualized framework suggests an emphasis of activities in line with persistent communication and learning across all organizational levels and systems.

Implications for Future Study

In this section, I present recommendations for future study based upon my findings from the present study, my experiences planning and executing it and what I heard from study participants.

This study was concerned with the perceptions of senior and unit leaders within a university's workforce. From the perspective of organizational design, these leaders were "managing from the middle" in terms of the administrative structure of this research site. I could have designed a study that was concerned with how senior executives in higher education conceptualized efficiency and/or organizational learning, but I chose to study senior and unit level leaders because I sensed they would have been "close enough to the fray" to offer informed views of what Lean methodology and methods looked like in terms of the design and implementation of efficiency projects in higher education.

I believe that future studies regarding efficiency and organizational learning would benefit from inquiry about how college and university executives conceptualize key organizational concepts. In concert with the views of presidents and CEOs, it would be additionally insightful to seek what board chairs and board members are thinking in terms of the relationship of short-term and long-term efficiencies, their role as institutional stewards and how they view aspects of employee development and service.

An additional angle for future researchers to consider would be the experiences, conceptualizations and voices of students of universities and colleges that are pursuing efficiency initiatives and/or organizational learning. In the case of radical transformations, how did students perceive the services of the university or college or its teaching and research capacity prior to and after such transformations? How "close" are students to the phenomena of organizational directives such as efficiency and learning and how does it affect them and their short and longer-term views of their institution?

This study employed a case study methodology, supplemented by qualitative research methods and qualitative data analysis methods to tell its story and put forth its themes and conclusions. There were a number of methodology alternatives that I considered that may be of interest to future researchers.

For example, in a macro sense, it would be possible and perhaps advisable for researchers to compare government mandates for institutional mission (along with legislated acts) and official government communications to the performance of institutions. These could be defined through key institutional performance indicators, the nature of institutional planning and how key organizational actors conceptualize the use of resources. This, in turn, could be used to derive values and definitions of efficiency beyond ratios of required inputs and outputs. The term "efficiency" carries implied values and these values will change depending on the background of the person who uses the term, what their worldview is and how they conceptualize efficiency.

In terms of anonymity and transparency of experience and data, I hope that future researchers can conduct studies regarding organizational learning and efficiency improvement in higher education in an open fashion and more freely solicit the opinions

and views of a greater number of affected participants at the executive, faculty, employee and student levels. There is much to gain by comparing institutional experiences regarding efficiency through the collaboration of many universities and colleges.

Finally, quantitative methods might be employed in a number of creative ways to both the concepts of efficiency and organizational learning. Document analysis (and perhaps even financial analysis) would be possible as it relates to organizations that have followed efficiency initiatives to see how they quantified organizational gains. In the case of organizational learning, it would seem more difficult to study it by quantitative means, but assessing cultural issues and considering what departmental performance has been at the person and unit level might suggest interesting concepts that would benefit from a quantitative or mixed methods approach.

Chapter Summary

In this chapter, I presented the study's themes and conclusions and a related discussion of the study's findings. I then presented implications for practice, policy and theory, including a reconceptualization of the study's conceptual framework. Finally, I presented implications for further study.

I presented four themes regarding the study as follows: effective communication promoted learning and enhanced efficiency; conceptions of organizational learning focused predominantly on the unit; efficiency methodology was superordinate to efficiency method; and learning was conceptualized as an essential project resource. I then presented two conclusions regarding the study as follows: there is a relationship between efficiency initiatives and organizational learning; and effective communication can offset system limitations.

The study's themes and conclusions were then presented in contrast with theories of organizational learning and efficiency. These notions followed organizational learning typologies developed by Ortenblad (2002) and Meyer (1982). A contrasting perspective was offered between themes and conclusion and reports of Lean in higher education.

The implications of the study were presented as they related to practice and policy as well as theory. A reconceptualization of the study's conceptual framework was presented. Recommendations for future research were then presented, relating to future participant groups and how efficiency projects in higher education might be studied from the perspectives of different participant groups and research methodologies.

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APPENDIX A:

SAMPLE LETTER OF INTRODUCTION

Sample Introductory Letter

(Insert Date)
Dear Participant,

My name is David Francis and I am a Ph.D. candidate in the Department of Educational Administration at the University of Saskatchewan. My study is titled **A Study of Organizational Learning in a University Efficiency Initiative**.

The purpose of this case study is to determine how staff members perceive a university efficiency (Lean) initiative from the perspective of organizational learning principles. There are links in the literature regarding the use of Lean in post-secondary institutions and a need for organizational learning to ensure successful outcomes.

Organizational learning has been defined in a number of ways. These definitions focus on how individual learning differs from group learning, how learning enhances organizational efficiency and effectiveness and how a systems approach might benefit learning. Senge (1990) proposed that the systems approach to organizational learning constituted a *Fifth Discipline*: a framework that uses a series of tools to help people find patterns in their work to enhance learning and promote organizational change. This study uses a conceptual framework based on systems-based theory regarding organizational learning and research about efficiency and the use of Lean in post-secondary institutions. This study will benefit those interested in advancing organizational learning theory and those interested in enhancing the efficiency of post-secondary institutions through change initiatives.

I will use multiple sources of data in this study, including the review of documents and interviews. I would like to interview you in a semi-structured format about your experiences in working on an efficiency (Lean) initiative in your University workplace. The interview should take between 60 and 90 minutes. Prior to meeting at a time that is suitable for you, I will send the questions to you by e-mail so you may have time to consider your responses. After completing the initial interview and reflecting on the responses, I will send you an edited transcript of your responses by e-mail so that you may contribute further detail or revise any parts that your contributed. A second semi-structured interview will then be scheduled that focuses more on the themes expressed by participants during the first interview phase. You will also be asked to sign a transcript release form when you are satisfied with the transcripts. Data resulting from interviews will be coded in order to determine themes and focused questions for the second phase of interviews. Direct quotations from the interviews may be used, however, participant anonymity will be preserved and the institution will not be named in the research study or its derivative works.

The resulting research may be used for presentation at conferences, professional venues and scholarly and professional publications. Your cooperation in this study would be greatly appreciated. If you agree to participate, please read and sign the consent form.

If you have any questions or concerns about the study, do not hesitate to contact me at david.francis@usask.ca or by phone 306.715.5472. Thank you in advance for your consideration and cooperation in participating in this study.

Regards,

David Francis, Ph.D. Candidate
University of Saskatchewan

APPENDIX B:

CONSENT AND RELEASE FORMS

Letter of Consent for Personal Interview Participation

Name:
Position:

I hereby agree to participate in the research to be conducted by David Francis entitled *A Study of Organizational Learning in a University Efficiency Initiative* under the conditions set out in the letter of introduction. I understand that my participation involves two personal interviews, each anticipated to be approximately one hour to one hour and a half in length. I understand that the information gathered may be used as data for publications related to this study including the researcher's dissertation. Results of the study may be presented at academic conferences or published in scholarly journals. I understand that confidentiality will be maintained, as far as possible, and that I am free to withdraw from the study at any time, for any reason and without any type of penalty. I understand that I will be advised of any new information that may affect my decision to participate in this study. I understand that I will be given the opportunity to review the transcribed data and that I may revise, delete or add information then sign the release form. My right to withdraw data from the study will apply until the data has been pooled. After this it is possible that some form of research dissemination will have already occurred and it may not be possible to withdraw my data. If I have any questions, I may contact the researcher, David Francis, by phone at 306.715.5472 or by e-mail at david.francis@usask.ca.

This research project has been approved on ethical grounds by the University of Saskatchewan Research Ethics Board. Any questions regarding your rights as a participant may be addressed to that committee through the Research Ethics Office (ethics.office@usask.ca or (306) 966-2975). Out of town participants may call toll free (888) 966-2975.

I, , have read this form and discussed this study with the researcher. By signing this form, I give my consent to participate in this study. I have received a copy of this consent form for my personal records.

Participant signature:

Researcher signature:

Date:

Data/Transcript Release Form – Personal Interviews

I, , have reviewed all of the transcribed data of my personal interview(s) in this study and acknowledge that the transcribed data reflects what I said in my personal interview(s) with the researcher, David Francis. I hereby authorize the release of this transcribed data to David Francis to be used in the manner described in the letter of introduction and the consent form. I have received a copy of this Data/Transcript Release Form for my personal records.

Partcipant:

Researcher:

Date:

APPENDIX C:

SEMI-STRUCTURED INTERVIEW QUESTIONS

Semi Structured Interview Questions

Principal Investigator: David Francis, Ph.D. candidate, Department of Educational Administration
Supervisor: Dr. Patrick Renihan, Department of Educational Administration

Participant:
Department/Unit:

Interview Protocol

Phase I Interviews are anticipated to take approximately 1 hour. Phase II interviews are anticipated to take approximately 40 minutes. Interviews will be recorded in digital file format with the permission and knowledge of the participants. The interview format will be fully described to participants and they will have a chance to ask questions about the interview, the research process or any other aspect of the study. Per university ethics requirements, participants may withdraw from the interview or the research project at any time for any reason simply by requesting so verbally or in writing. Participants will be informed of their rights both in written and spoken format before interviews.

In this semi-structured interview, the interviewer will ask follow up questions relating to participant responses. Follow up questions are intended to seek more information about the themes present in participant's responses.

Phase I questions: Setting the stage/participant background

1. Can you briefly describe your role in your department? How long you have worked at the university and/or your department?

2. From your point of view, can you describe the nature of the efficiency project including its objectives, timelines, staffing etc.? Why do you think this project was proposed?

Phase I questions (text in italics not read to participants)

1. *(Individual Learning/Personal Mastery)*

   What was the significance of this project for you individually? What new learning (knowledge, appreciations, skills) did it involve for you or others in your unit? How challenging was this for you?

2. *(Mental Models)*

   Did this project change the way in which you view the work of your unit, and your part in that work?

3. *(Shared Vision)*

   What was the vision of this project?
   Did others in your unit share the same vision?

4. *(Team Learning)*

   How did participants work as a team on this initiative?
   Did the project involve learning as a team?
   Describe how this occurred.

5. *(Systems Thinking)*

   What value do you think Lean has for the university as a whole?
   What can the university learn from this type of initiative?

   Possible Follow Up: What are the main challenges to the success of these types of projects? What suggestions would you make for projects of this nature in future?

Phase II questions (text in italics not read to participants)

1. *(Individual Learning: Personal Mastery/Mental Models)*

   Please share reflections about your personal learning experience as you prepared for and participated in the improvement project. What did you notice about approaches to learning that were followed by your peers?

2. *(Unit Learning: Shared Vision/Team Learning)*

   Do you think your department has experienced learning as a result of engaging in an improvement project? How prepared is your department if you were to pursue another improvement project?

3. *(Organizational Level Learning: Systems Thinking)*

   Based upon on your improvement project experience, what advice would you offer the university about preparing for and supporting improvement projects?

Thank you for your participation! Describe next steps and follow up.

APPENDIX D:

STUDY CATEGORIES AND SUBCATEGORIES

Categories and Subcategories

Research Question One

Context and System Inputs

Senior Leaders	Unit Leaders
- Business Need for Improved Efficiency	- Business Need for Improved Efficiency
- Perceiving Learning in Context	- Perceiving Learning in Context
- Perceiving Efficiency in Context	- Perceiving Efficiency in Context

Research Question Two

Personal Mastery

Senior Leaders	Unit Leaders
Leadership Skills to Manage:	Affecting Professional Practice:
- Change	- Affecting Culture
- Communication	- Enhancing Efficiency of Processes
- Complexity	- Managing Work Volume
- Culture	
- Employee Fear	
- Work Volume	

Mental Models

Senior Leaders	Unit Leaders
Affective Domain of Participants:	Affective Domain of Participants:
- Enhanced Employee Motivation	- Value of Employee Intuition
- Feeling a Sense of Momentum	
Using Industry Best Practices:	Using Industry Best Practices:
- Increased Centralization and Planning	- Enhanced Customer Focus
- Enhanced Customer Focus	- Common Inventory Practices
- Participatory Approach	- Promoting Standards and Measurement
- Use of Measurement and Standards	

Research Question Three

Shared Vision

Senior Leaders	Unit Leaders
Established at Project Inception:	Established at Project Inception:
- Established Through Buy-In - Established Through Training	- Established Through Training
Established Through Mission: - Institutional Mission of Efficiency	Established Through Mission: - Institutional Mission of Efficiency - Mission of Safety

Team Learning

Senior Leaders	Unit Leaders
Managing Tensions: - Individual vs. Group Goals - Team Dynamics	Managing Tensions: - Team Dynamics
Project Flow and Definition - Formal Versus Informal Projects - Prioritizing Projects	Project Flow and Definition - Establishing the Why

Research Question Four

Systems Thinking

Senior Leaders	Unit Leaders
System Enablers: - Centralization - Collaboration - Organizational Communication - Organizational Memory	System Enablers: - Consistent Policy and Practice - Organizational Communication
System Stressors: - Managing Change Fatigue - Managing Organizational Fear	System Stressors: - Investing in Systems or People - Unanticipated Consequences